PROPOSED
LIVESTOCK GRAZING
MANAGEMENT

for the

Willow Creek Planning Unit

Draft Environmental Impact Statement

United State Department of the Interior
Bureau of Land Management
California

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
District Office
P. O. Box 1090
Susanville, California
96130

IN REPLY REFER TO
1792 (C-020)
Willow Creek

Dear Reviewer:

Enclosed for your review and comment is the draft environmental impact statement prepared on the Proposed Domestic Livestock Grazing Management Program for the Willow Creek Planning Unit of Lassen County, California, within the Susanville BLM District.

The statement was prepared pursuant to Section 102(2)(C) of the National Environmental Policy Act of 1969. It is based on information from the Bureau of Land Management and other sources, including Federal, State, and local agencies, and interested private organizations and citizens.

This EIS follows a slightly different, more concise format than previous BLM grazing EISs. It is designed to reduce preparation time and printing costs and to provide a clearer, more readable document, allowing easier identification of and greater emphasis on those issues which have been identified as being of concern to the public. We hope this document will be more understandable and easier to use.

Comments on the environmental impact statement should be received by this office no later than APR 19 1982 to be considered in the final statement. Your comments should be returned to:

District Manager
Bureau of Land Management
P. O. Box 1090
Susanville, California 96130

Sincerely yours,

C. Rex Cleary
District Manager

Draft Environmental Impact Statement

PROPOSED DOMESTIC LIVESTOCK GRAZING MANAGEMENT PROGRAM FOR THE WILLOW CREEK PLANNING UNIT LASSEN COUNTY, CALIFORNIA

Prepared by
Department of the Interior
Bureau of Land Management
Susanville District

The Bureau of Land Managment proposes to implement a livestock grazing management program on 296,978 acres of public land in the Willow Creek Planning Unit of northeastern California. The overall objectives are to improve vegetation condition and increase forage production for multiple use on a sustained-yield basis. Components of the five alternative plans include: (1) adjustments of authorized livestock uses; (2) categories of grazing management intensities, and (3) range improvements including vegetation manipulation and construction of reservoirs, fences, windmills, spring developments, and water tanks and troughs. Environmental consequences of each of the alternatives are described in an introductory summary and in Chapter 4 of the EIS.

ACTING STATE DIRECTOR
CALIFORNIA STATE OFFICE

For further information contact: Mark Morse, Area Manager
Eagle Lake Resource Area
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P. O. Box 1090
Susanville, California 96130

Dates by which comments are due: APR 19 1982

SUMMARY

This EIS examines 5 alternatives:

A. Proposed Action
B. Decreased Livestock Use
C. Increased Livestock Use
D. No Action
E. No Grazing

Dealing with 5 issues:

1. Wildlife/livestock conflicts (forage and special habitats)
2. Possible economic losses to ranchers and inadequate government funding for implementation of plan
3. Management of Eagle Lake Basin
4. Protection of Willow Creek
5. Improving and maintaining range condition

Concerning livestock grazing:

- On 296,978 acres of public land.
- In the Willow Creek Planning Unit, Susanville District, BLM.

Alternative A - Proposed Action

The objective of this alternative is to preserve existing grazing preference and allow increased livestock use in allotments with excess forage while minimizing conflicts between livestock and other resource values.

Major components include:

- Allotment boundary modifications resulting in an overall decrease of 1 allotment.
- Minimal grazing permittee adjustments on 5 allotments.
- Allocation of forage for 27,447 AUMs of livestock use (4,190 AUMs over current levels), objective deer and pronghorn populations (11,100 and 1,250, respectively), and 15 wild horses.
- Management of 11 allotments with AMPs and 15 allotments without AMPs.
- Categorization of allotments according to similar characteristics and management needs (9 Maintenance, 10 Improvement, and 7 Custodial Allotments).
- Construction of 87 miles of fence, 6 cattleguards, 3 wells (windmills), 60 reservoirs, 15 spring developments, and 76,200 acres vegetation manipulation at a total cost of $987,800.
- Livestock seasonal use adjustments on 4 allotments.
- Protection of conflict areas, including fencing 7 linear miles of Willow Creek, 4 miles of Eagle Lake shoreline, the Snowstorm Wetland Waterfowl Project Area, and excluding livestock use from Rocky Point Campground, except by special permit.

Environmental consequences include:

- Slight overall enhancement of wildlife habitat with mule deer and pronghorn populations increasing toward objective numbers.
- Increase of $59,000 in cattle sales.
- General improvement in the environmental, recreational, and visual qualities of the Eagle Lake Basin and the Willow Creek Canyon. In particular, fencing 7 miles of Willow Creek would significantly improve fish and wildlife cover, streambank stability, soil cover, attractiveness for fishing, hiking, swimming, and sightseeing, enhance scenic quality, improve water quality, and reduce cultural resource site deterioration.
- Overall improvement in rangeland condition, including a 42 percent increase in excellent and good condition, a 0.1 percent decrease in fair condition, and an 11 percent decrease in poor condition lands.
- 22 percent increase in vegetation production.
- Overall decrease in soil erosion although soil values in unprotected semi-wet meadows would continue to be degraded through compaction and gullying.
- Improvement in livestock performance.
- Gradual increase in hunting opportunities for deer and pronghorn as populations increased toward objective numbers. Improvement in hunting opportunities for sage grouse, quail, and chukar.
- Moderate impacts to the Tunnison Mountain Wilderness Study Area which would be allowable under the Bureau's Wilderness Management Policy.
- Continued moderate impacts to cultural resource sites, including breakage of surface materials, displacement of spatial patterning, and mixture of near-surface vertical deposits caused by livestock trampling and other related impacts. Severity of impacts would vary with intensity of use. Land treatments could seriously impact sites, if surface disturbance methods were used.

Alternative B - Decreased Livestock Use

The objective of this alternative is to emphasize nonlivestock uses and values, particularly wildlife, recreation, watershed, and aesthetics, without completely disrupting the area's social and economic livestock base.

Major components include:

- Same allotment boundary modification and grazing permittee adjustments as for the Proposed Action.
- Allocation of forage for 15,278 AUMs of livestock use (7,979 AUMs below current levels), objective deer and pronghorn populations, and 15 wild horses.
- Management of 12 allotments with AMPs and 14 allotments without AMPs.
- Same categorization of allotments as for the Proposed Action.
- Construction of 84.5 miles of fence, 6 cattleguards, 31 reservoirs, and 41,300 acres of vegetation manipulation. Projects would be designed primarily to benefit nonlivestock resources and would cost a total of $665,400.

- Significant livestock seasonal use adjustments, including a 15 to 75 day delay in spring turnout on 23 allotments to favor deer and pronghorn fawning and kidding habitat, and a 15 to 135 day earlier removal to favor deer and pronghorn winter range.
- Protection of conflict areas, including fencing 7 linear miles of Willow Creek, the entire BLM portion of the Eagle Lake shoreline (including Rocky Point Campground), and the Snowstorm Wetland Waterfowl Project area.

Environmental consequences include:

- Moderate overall enhancement of wildlife habitat with mule deer and pronghorn populations increasing toward objective numbers.
- Decrease of $112,000 in cattle sales.
- Improvement of environmental, recreational, and visual qualities of the Eagle Lake Basin by eliminating all livestock impacts from the Eagle Lake shoreline.
- Same improvement in Willow Creek as for the Proposed Action.
- Overall improvement in range condition, including a 23 percent increase in excellent and good condition, a 2 percent decrease in fair, and a 5 percent decrease in poor condition rangeland.
- 17 percent increase in vegetation production.
- General improvement in soil condition, decreased erosion, and improved streambank stability.
- Improvement in livestock performance.
- Increase in hunting opportunities for deer and pronghorn as under the Proposed Action, but at a faster rate. Slight improvement in sage grouse hunting opportunities over the Proposed Action with quail and chukar similar to the Proposed Action.
- Minor impacts to wilderness characteristics. Acceptable under Bureau Wilderness Management Policy.
- Reduced impacts (i.e., trampling, erosion, surface displacement, etc.) to cultural resource sites.

Alternative C - Increased Livestock Use

The objective of this alternative is to allow a higher level of livestock use by maximizing the potential of the rangeland resource and giving priority to livestock over other competitive resources.

Major components include:

- Same allotment boundary modifications and grazing permittee adjustments as for the Proposed Action.
- Allocation of forage for 30,874 AUMs of livestock use (7,617 AUMs above current levels), existing deer and pronghorn populations (6,600 resident and 800 resident, respectively), and 15 wild horses.
- Management of 20 allotments with AMPs and 6 allotments without AMPs.
- Same categorization of allotments as for the Proposed Action.

- Construction of 90 miles of fence, 6 cattleguards, 3 wells (windmills), 61 reservoirs, 15 spring developments, and 105,800 acres of vegetation manipulation. Projects would be designed primarily to benefit livestock and would cost a total of $1,259,300.
- Allowance of earlier livestock turnout on the Humphrey 3C and Tablelands Allotments. Maintenance of existing seasons of use in the remaining allotments.
- Allowance of unlimited access by livestock to all conflict areas.

Environmental consequences include:

- Slight to moderate decline in wildlife habitat condition in general and all special wildlife habitat areas. Slight to moderate decrease in all populations of major game species, except chukar which are adaptable to below potential range condition. Decline in fishery habitat and potential in Willow Creek.
- Increase of $107,000 in cattle sales.
- Overall reduction of environmental, recreational, visual, and cultural resource values within the Eagle Lake Basin. Increased livestock use in the Eagle Lake Basin would allow continued livestock wandering and grazing of near shore tules and shoreline vegetation in popular shoreline recreation use areas, further deteriorate cultural resource sites, produce conspicuous visual impacts in conflict with the Bureau's visual resource management policy, further increase soil erosion, and decrease water quality.
- Degradation of Willow Creek Canyon's environmental, recreational, visual, and cultural resources. Increased livestock use without protective measures would significantly increase soil compaction, streambank deterioration, and destruction of riparian vegetation, decrease water quality, further degrade fisheries potential, accelerate destruction of cultural resource sites, reduce attractiveness for fishing, hiking, hunting, and sightseeing, and lower scenic values within the canyon.
- Overall improvement in range condition including a 74 percent increase in excellent and good condition, a 1 percent decrease in fair condition, and a 15 percent decrease in poor condition rangeland.
- 46 percent increase in vegetation production.
- Increased soil compaction and erosion and decreased cover in areas of heavy livestock concentrations. Continued degradation of semi-wet meadows. Long term improvement in soil conditions where livestock distribution is improved and within the vegetation manipulation areas.
- Slight decrease in overall water quality although beneficial uses would not be affected.
- Improvement in livestock performance.
- Probable slight decrease in hunting opportunities for deer, pronghorn, sage grouse, and quail. Slight increase in hunting opportunities for chukar.
- Creation of distinct visual contrasts, although most affected areas fall within Class IV VRM areas which allow major visual changes.

- Violation of wilderness nonimpairment criteria from proposed seeding within the Tunnison Mountain WSA. Degradation of existing wilderness values from increased livestock use along Willow Creek with no protection.
- Accelerated destruction of cultural resource sites through trampling, site displacement, and erosion of sites. Land treatments, if they involved surface disturbing methods on or near cultural sites, would have particularly severe impacts.

Alternative D - No Action

The objective of this alternative is to preserve the status quo for livestock grazing management.

Major components include:

- Maintenance of existing grazing management practices, allotment boundaries, AMPs, and range developments.
- Allocation of forage to existing levels of 23,257 AUMs of livestock use, existing deer and pronghorn populations (6,600 resident and 800 resident, respectively), and 15 wild horses.

Environmental consequences include:

- General slow decline in habitat condition for deer, pronghorn, sage grouse, quail, mourning dove, waterfowl, and fisheries. Failure to attain objective numbers of deer and pronghorn. Continued degradation of all special wildlife habitat types.
- No change in cattle sales.
- Continued adverse impacts on recreation and scenic resources from livestock use along popular Eagle Lake shoreline use areas west of Highway 139 and on Rocky Point.
- Continued adverse impacts on Willow Creek Canyon, including further degradation of the streambank cover, water quality, scenic quality, cultural resource sites, and fishery potential.
- No significant change in range condition or production.
- Overall continued soil compaction, accelerated erosion, streambank deterioration, and degradation of water quality.
- Slight decrease in hunting opportunities for deer, sage grouse, and quail. Slight increase in hunting opportunities for pronghorn.
- Continued site displacement, artifact breakage, and increased erosion of cultural resource sites.

Alternative E - No Grazing

The objective of this alternative is to allow the environment to respond to its full potential without the influence of livestock grazing.

Major components include:

- Cancellation of all livestock grazing permits.
- Management for objective deer (11,100) and pronghorn (1,250) populations, and 15 wild horses.
- Construction and maintenance of improvements only to benefit nonlivestock resources.

Environmental consequences include:

- Elimination of all present and potential livestock conflicts. Increase in deer and pronghorn populations toward objective numbers although over the long term, as vegetation composition moves toward climax, deer populations would slowly decline. Significant increase in sage grouse populations, slight increase in quail, dove, and resident waterfowl populations, and improvement of fisheries habitat within the Willow Creek corridor. Significant improvement in willow-riparian and semi-wet meadow special wildlife habitat types, with slight improvement in bitterbrush and mahogany areas and aspen stands.
- Loss of $326,000 in cattle sales.
- Improvement in recreational enjoyment, scenic quality, water quality, and soil stabilization in the Eagle Lake Basin.
- Increase in Willow Creek streambank vegetation and water quality, enhancement of trout populations, decrease in erosion and soil compaction, elimination of trampling of cultural sites by livestock, and improvement in scenic quality of the canyon and its attractiveness for fishing, hiking, swimming, and sightseeing.
- Improvement in range condition, including a 117 percent increase in excellent and good condition, an 18 percent decrease in fair condition, and a 3 percent decrease in poor condition rangeland.
- 17 percent increase in vegetation production.
- Overall improvement in soil condition and water quality.
- Initial increase and eventual gradual decline in hunting opportunities for deer. Increase in pronghorn hunting opportunities of up to 56 percent. Significant increase in hunting opportunities for sage grouse, slight increase in quail and dove hunting, and slight decrease in chukar hunting.
- Enhancement of scenic quality and wilderness values, and significant reduction in cultural resource site deterioration.

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Chapter 1

Introduction

Chapter 1

INTRODUCTION

LOCATION OF THE STUDY AREA

The study area is the Susanville District's Willow Creek Planning Unit, shown on MAPS 1-1 and 1-2.

The Willow Creek Planning Unit, located entirely in Lassen County, includes 296,978 acres of public land within the total 575,910 acre area. The unit is roughly bordered by U. S. Highway 395 on the south and east, Lassen National Forest on the west, and Madeline Plains on the north. It lies just north of Susanville, California.

PURPOSE OF AND NEED FOR ACTION

The purpose of the proposed grazing management is to manage the resources (soil, water, vegetation, wildlife habitat, livestock forage, etc.) of the Willow Creek Planning Unit within a multiple-use framework, as mandated by various laws (Taylor Grazing Act, 1934; National Environmental Policy Act, 1969; Federal Land Policy and Management Act, 1976; Endangered Species Act, 1973; Public Range Lands Improvement Act, 1978; etc.). The objective is to maintain or improve the condition of public land resources.

The need for this document evolves from the general need to establish programs for improving rangeland condition on our public lands. Much of the rangeland in the Willow Creek Planning Unit is producing forage below potential. Important wildlife habitat such as willow riparian and meadow areas is below potential while deer and antelope reasonable and objective numbers have yet to be met. These and other resource problems have established the need for a sound grazing management program to improve range condition, soils and water, wildlife habitat, and other resources on public lands within the Willow Creek Planning Unit while still maintaining social and economic stability among the authorized livestock operators.

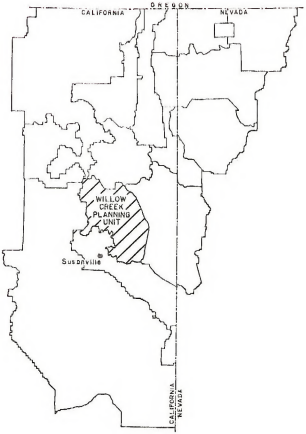
MAJOR ISSUES

1. Wildlife-Livestock Conflicts

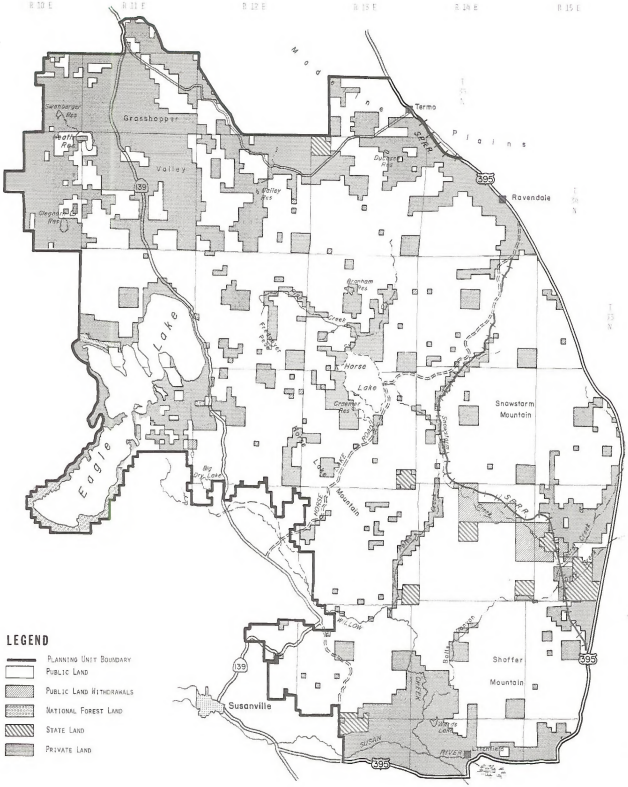
   - Wildlife-livestock competition on special habitat types such as meadows, bitterbrush and mahogany stands, and willow-riparian zones.
   - Equitable and adequate forage allocation for wildlife and livestock.

2. Economics

   - Potential loss of income for livestock permittees due to reductions in livestock numbers, adjustments in seasons and areas of use, or changes in management requirements.
   - Adequate government funding for implementation of plan.



WILLOW CREEK
PLANNING UNIT
GENERAL LOCATION
MAP 1-1



WILLOW CREEK
PLANNING UNIT
LAND OWNERSHIP

3. Management of Eagle Lake Basin

   - Use and management of the Eagle Lake Basin: limitations on activities in order to protect the lake's values.

4. Protection of Willow Creek Values

   - Conflicts between livestock and other resources (water quality, fish and wildlife habitat, recreation, visual resources, wilderness, and cultural resources) in the Willow Creek corridor.

5. Range Condition and Production

   - Improvement of poor/fair condition range.
   - Maintenance of good/excellent condition range.
   - Increase in overall forage production.

Chapter 2

Alternatives

Chapter 2

ALTERNATIVES INCLUDING THE PROPOSED ACTION

GENERAL LAND USE GOALS

1. To maintain and improve rangeland condition and production within 20 years as follows:

   - Improvement of 25% of the poor condition rangeland to fair.
   - Improvement of 50% of the fair condition rangeland to good.
   - Maintenance of all good and excellent rangeland.

2. To maintain or improve the condition of special wildlife habitat types, including riparian areas, meadows, pronghorn kidding grounds, and mule deer fawning areas.

3. To allocate forage for objective wildlife populations as determined by the California Department of Fish and Game.

4. To manage the wild horse population to assure healthy herd condition as well as to prevent undue destruction of the range from overpopulation.

5. To improve water distribution.

6. To increase or maintain the quality and quantity of water on or beneath public lands so as not to degrade the beneficial uses of that water, including floodplain and wetland values. (This would meet the Best Management Practices objective.)

7. To maintain or enhance soil, within its potential as a growing medium for range plants, to provide for the sustained yield of desirable range plants. Generally, on range lands, 2 tons/acre/year is considered tolerable surface soil loss.

8. To minimize disruption of the social and economic environment of the local community with special consideration for the family owned and operated ranch lifestyle.

9. To give special consideration and priority to the protection and management of areas with special environmental concerns.

10. To protect archaeological and historic resources and areas potentially suitable for wilderness consideration, as required by law.

11. To improve or maintain the overall recreation and scenic qualities of the planning unit.

DEVELOPMENT OF ALTERNATIVES

Selection of Alternatives

This environmental impact statement analyzes a proposed action and four other grazing management alternatives. Alternative A, the Proposed Action, is a product of land use planning, scoping sessions, public input, and individual permittee meetings and has been designated as the Bureau's preferred alternative.

Alternatives B and C, Decreased Livestock Use and Increased Livestock Use, respectively, were developed to allow assessment of a range of livestock grazing use. Alternatives D and E, No Action and No Grazing, respectively, are required alternatives. They allow analysis of status quo grazing management and the elimination of livestock grazing on public rangeland, as bases for comparison with the other management alternatives.

Planning and Environmental Analysis Process

The Proposed Action is one part of the planning process which contains three stages described below: information gathering, land use planning, and implementation of the plan. Public participation is an important part of each stage and plays a vital role in the entire planning process.

1. Information Gathering

   - Issues and data needs.
   - Resource inventory.
   - Data assimilation and analysis.

2. Land Use Planning

   - Resource recommendations presented.
   - Recommendations analyzed and conflicts resolved.
   - Grazing related recommendations formulated into Proposed Action and alternatives.
   - EIS prepared.
   - Land use decisions made.
   - Initial Rangeland Program Summary (RPS) developed, containing proposed grazing decisions.
   - Affected operators consulted on proposed grazing decisions.
   - RPS Update issued, reflecting modification or verification of proposed grazing decisions based on consultation.
   - Final grazing decisions issued.

3. Implementation

   - Resource activity plans such as Allotment Management Plans (AMPs).
   - Environmental Assessments completed before starting any project.
   - Implementation schedules depend on available funding for projects.

Adjustments in livestock use would normally be phased in over a 5 year period. During this period, a new decision could be issued if monitoring information (page 2-33) indicates rangeland conditions are not improving at the rate anticipated and that the original decision should be adjusted accordingly. If a decision is modified based on monitoring, the authorized livestock grazing use would be brought into balance with the updated allocation by the conclusion of the 5 year period specified in the original decision.

Selective Management Categories

Included in Alternatives A, B, and C is a classification of allotments into Selective Management Categories. This approach is based upon a concept that:

- Grazing allotments can be grouped into three resource management categories based on resource, social, economic, and management criteria.
- Grazing management intensity can be formulated based on resource management need.
- The grouping of grazing allotments between and within categories can establish a priority ranking for the investment of public funds and management efforts.

Selective management directs funds and management to where they will be most effective. Each allotment was analyzed and ranked according to category characteristics developed during previous land use planning stages (U. S. Department of the Interior, 1981b and 1981c).

The need for allotment management plans (AMPs) has been identified by allotment (Alternatives A, B, and C, TABLES 2-1, 2-4, and 2-7), but specific grazing systems are not identified at this time. Because further consultation with grazing permittees and other affected interests is needed to develop grazing systems, the systems will be determined after completion of the Final EIS and land use plan and incorporated in the subsequent planning documents (i.e., Rangeland Program Summary).

A description of the three management categories is as follows:

Maintenance Category

- Principal objective - to maintain or improve the existing situation.
- Range condition satisfactory.
- Current management acceptable or may require minor adjustments.
- Vegetation production at or near potential.
- Limited or no resource conflicts.
- Possible limited positive economic return.
- Size and land status variable.

Improvement Category

- Principal objective - to improve resource conditions.
- Range condition fair to poor on major allotment portions.
- Current management inadequate and can be improved.
- Vegetation production below potential with opportunity to increase.
- Resource conflicts and concerns evident.
- High potential for positive economic return.
- Size relatively large.
- Land status displays significant, well blocked public lands.

Custodial Category

- Principal objective - to prevent deterioration of conditions.
- Range condition fair to poor, but has stabilized.
- Vegetation production low with limited potential to increase.
- Resource conflicts and concerns limited.
- Little potential for positive economic return.
- Size relatively small.
- Land status variable, but generally contains significant private lands.

ALTERNATIVE A - PROPOSED ACTION

The objective of this alternative is to preserve existing grazing preference and allow increased livestock use in allotments with excess forage while minimizing conflicts between livestock and other resource values.

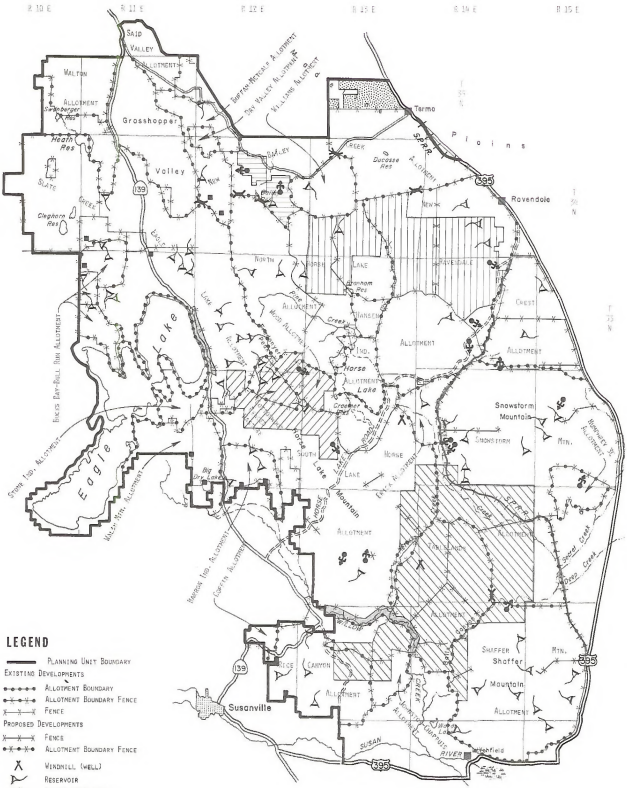
Major Components

1. Allotment Boundary Modifications (MAP 2-1)

   a. Establish the Crest Allotment by combining the Clark Allotment with the south half of the New Ravendale Allotment. The Clark Allotment would no longer be necessary as it is not separately fenced and livestock use intermingles with adjoining rangeland. The Crest Allotment would be separated from the New Ravendale Allotment along the existing drift fence to formalize a range line between the two permittees.

   b. Combine the Shumway Allotment with the north half of the New Ravendale Allotment to form the realigned New Ravendale Allotment. By combining the two allotments and constructing 4 miles of fence, a three pasture grazing system could be designed for 32,000 acres of rangeland.

   c. Adjust and fence the boundary between the New Bailey Creek and Slate Creek Allotments to prevent livestock drifting between the two allotments.



WILLOW CREEK
PLANNING UNIT
PROPOSED ALLOTMENTS AND RANGE DEVELOPMENTS

ALTERNATIVE A
PROPOSED ACTION

2·1

2. Grazing Permittee Adjustments (TABLE 2-1)

a. Transfer a 434 AUM grazing permit from the Johnston-Chappuis to the South Horse Lake Allotment and transfer a 66 AUM permit from the Rice Canyon to the Johnston-Chappuis Allotment. These adjustments would eliminate the need to suspend grazing qualifications by reducing livestock use in the Johnston-Chappuis Allotment from 602 to 234 AUMs.

b. Split the two grazing permits now existing in the New Ravendale Allotment to allow individual use in the Crest and New Ravendale Allotments (See 1.a., above).

3. Forage Allocation (TABLES 2-1 and 2-2)

a. Authorize 27,447 AUMs of livestock use (an increase of 4,190 AUMs over present levels[1/]) including:

- An increase of 4,624 AUMs on seven allotments. 4,083 AUMs of this increase would result from the proposed vegetation treatments and would not be authorized until after the projects are developed and additional forage is produced. The remaining additional AUMs would come from existing excess forage production.
- A decrease of 434 AUMs on two allotments.
- Maintenance of existing use on 18 allotments.

Maintain or adjust stocking rates as follows:

- On Maintenance and Improvement Allotments, maintain the existing stocking rate, if it is within 20 percent of the estimated suitable forage.[2/]

- On Maintenance and Improvement Allotments, adjust the stocking rate, if it varies from the estimated suitable forage by more than 20 percent.

- On Custodial Allotments, maintain the existing stocking rate, if there are no conflicting resource values which would be adversely affected by such use.

- On the Tablelands Allotment, unless the medusahead invasion is rehabilitated resulting in an increase in livestock forage, maintain the existing preference use and manage the allotment on an annual production basis. Reduce livestock use during years of sub-normal precipitation to provide adequate vegetation ground cover for soil protection.

1/ Current active preference is 23,257 AUMs with no suspended preference.
2/ See APPENDIX A for a description of vegetation inventory methods and forage allocation procedures.

TABLE 2-1

Livestock Forage Allocation and Management
Alternative A - Proposed Action

Allotment	Suitability (Acres/AUMs) Total	Unsuitable	Potentially Suitable	Suitable	Proposed Use (AUMs)	Difference[1/] (AUMs/Percent)	No. Permit-tees	Use Season	Management Category	Type Manage-ment
Walton	930/73			930/73	94	-21/29	1	05/01-10/31	Custodial	Non-AMP
Said Valley	1,545/221	46/7	77/11	1,422/203	232	-29/14	1	04/16-10/31	Custodial	Non-AMP
Buffam-Metcalf	4,165/300	14/<1	346/25	3,805/274	246	+28/10	1	05/15-10/11	Maintenance	Non-AMP
Dry Valley	453/53			453/53	24	+29/54	1	04/16-10/31	Custodial	Non-AMP
New Bailey Creek	15,569/2,094	494/46	210/20	14,865/2,028	2,033	-5/<1	3	04/16-10/31	Improvement	AMP
Williams	3,058/478	136/21		2,922/457	519	-62/14	1	05/16-10/31	Maintenance	Non-AMP
New Ravendale	32,477/3,991	234/22	2,264/198	29,979/3,771	3,771	0	1	04/15-10/31	Improvement	AMP
N. Horse Lake	26,874/3,313	438/46	782/86	25,654/3,181	3,181	0	2	04/16-10/31	Improvement	AMP
Slate Creek	27,529/2,321	544/44	2,846/172[2/]	24,139/2,105	2,066	+39/2	3	04/16-10/31	Improvement	AMP
Bucks Bay	5,154/753	170/25		4,984/728	840	-112/15	1	05/01-09/30	Improvement	AMP
Hansen	1,263/175		107/15	1,156/160	129	+31/19	1	04/16-09/15	Custodial	Non-AMP
Crest	11,835/825			11,835/825	660	+165/20	1	05/16-09/15	Improvement	AMP
Snowstorm	43,681/4,651	4/<1	148/13	43,529/4,638	4,638	0	3	04/01-10/31	Improvement	AMP
Erick	2,475/218	50/4	124/11	2,301/203	230	-27/13	1	04/16-09/15	Maintenance	Non-AMP
Wood	2,189/234	17/2		2,172/232	253	-21/9	1	05/01-09/30	Maintenance	AMP
Cottonwood	1,692/142			1,692/142	114	+28/20	1	05/10-08/09	Maintenance	Non-AMP
Stone	882/87	26/3	20/2	836/82	50	+32/39	1	04/01-12/31	Custodial	Non-AMP
Walsh Mountain	4,780/342	53/4	764/55	3,963/283	291	-8/3	1	04/16-09/15	Maintenance	Non-AMP
Barron	4,309/203	266/12	1,205/57	2,838/134	122	+12/9	1	04/01-09/30	Maintenance	Non-AMP
S. Horse Lake	41,669/3,580	899/77	4,017/344[3/]	36,753/3,159	3,193	-34/1	7	04/01-08/31	Improvement	AMP
Humphrey 3C	5,096/573		1,661/187	3,435/386	309	+77/20	3	03/01-05/30	Custodial	Non-AMP
Tablelands	16,260/1,772	163/7	106/3[4/]	15,991/1,762	1,762	0	4	04/01-10/15	Improvement	AMP
Coffin	1,062/103	265/26		797/77	194	-117/152	1	05/01-10/31	Custodial	Non-AMP
Rice Canyon	10,800/931	797/69	2,055/177	7,948/685	649	+36/5	4	04/01-08/31	Maintenance	Non-AMP
Johnston-Chappuis	6,768/287	82/4	527/24[5/]	6,159/259	234	+25/1	1	04/16-06/30	Improvement	AMP
Shaffer Mountain	24,463/1,760	1,905/137	2,433/138	20,125/1,485	1,613	-128/9	2	04/01-08/31	Maintenance	Non-AMP
TOTALS	296,978/29,480	6,603/557	19,692/1,538	270,683/27,385	27,447	-63/<1				

1/ Difference between suitable forage and proposed use. Negative values indicate suitable forage would be less than proposed use; positive values indicate suitable forage would be greater than proposed use. See APPENDIX A for description of forage allocation procedures.
2/ 651 acres/18 AUMs unavailable due to livestock exclusion.
3/ 95 acres/7 AUMs unavailable due to livestock exclusion.
4/ 106 acres/3 AUMs unavailable due to livestock exclusion.
5/ 237 acres/12 AUMs unavailable due to livestock exclusion

TABLE 2-2

Vegetation Production Allocation[1/]
Alternative A - Proposed Action

ALLOTMENT	CATTLE Allocated[1/] (1000 lbs.)	CATTLE Available[2/] (1000 lbs./%)	WILD HORSES[2/] (1000 lbs./%)	DEER[2/] (1000 lbs./%)	PRONGHORN[2/] (1000 lbs./%)	TOTAL CONSUMPTIVE[2/3/] (1000 lbs./%)	NONCONSUMPTIVE[3/] (1000 lbs./%)	TOTAL[3/] (1000 lbs./%)
Walton	75.2	58.4/9.2	0	30.16/4.8	3.02/0.5	91.58/14.4	542.37/85.6	633.95/100
Said Valley	185.6	162.4/8.2	0	48.88/2.4	4.54/0.2	215.82/10.8	1,775.37/89.2	1,991.19/100
Buffam-Metcalf	196.8	219.2/5.3	0	52.00/1.2	11.34/0.3	282.54/6.8	3,867.21/93.2	4,149.75/100
Dry Valley	19.2	42.4/9.5	0	14.56/3.3	0.76/0.2	57.72/13.0	386.50/87.0	444.22/100
New Bailey Creek	1,626.4	1,622.4/6.4	0	771.68/3.0	34.02/0.1	2,428.10/9.5	23,130.49/90.5	25,558.59/100
Williams	415.2	365.6/9.5	0	98.80/2.6	6.05/0.2	470.45/12.3	3,363.01/87.7	3,833.46/100
New Ravendale	3,016.8	3,016.8/7.8	180.00/0.5	1,357.20/13.5	144.50/0.3	4,698.50/12.1	34,135.19/87.9	38,833.69/100
North Horse Lake	2,544.8	2,544.8/7.3	0	1,357.20/3.9	71.06/0.2	3,973.06/11.4	30,813.34/88.6	34,786.40/100
Slate Creek	1,652.8	1,698.4/4.8	0	1,461.20/4.1	88.45/0.3	3,248.05/9.2	32,193.15/90.8	35,441.20/100
Bucks Bay	672.0	582.4/7.8	0	336.96/4.5	8.32/0.1	927.68/12.4	6,522.19/87.6	7,449.87/100
Hansen	103.2	128.0/6.6	0	111.28/5.7	7.56/0.4	246.84/12.7	1,691.48/87.3	1,938.32/100
Crest	528.0	660.0/4.3	0	359.84/2.3	21.38/0.1	1,041.22/6.7	14,329.04/93.3	15,370.26/100
Snowstorm	3,710.4	3,710.4/7.2	0	2,934.36/5.7	197.64/0.3	6,842.40/13.2	44,824.11/86.8	51,666.51/100
Erick	184.0	162.4/7.1	0	61.36/2.7	7.13/0.3	230.89/10.2	2,026.53/89.8	2,257.42/100
Wood	202.4	185.6/4.6	0	123.76/3.1	4.54/0.1	313.90/7.8	3,661.08/92.2	3,974.98/100
Cottonwood	91.2	113.6/4.0	0	116.48/4.1	9.45/0.3	239.53/8.4	2,608.82/91.6	2,848.35/100
Stone	40.0	65.6/10.6	0	34.32/5.5	3.02/0.5	102.94/16.6	513.64/83.4	616.58/100
Walsh Mountain	232.8	226.4/5.3	0	166.92/3.9	8.32/0.2	401.64/9.4	3,883.64/90.6	4,285.28/100
Barron	97.6	107.2/2.7	0	83.20/2.1	4.91/0.1	195.31/4.9	3,787.58/95.1	3,982.89/100
South Horse Lake	2,554.4	2,532.8/5.3	0	2,776.80/5.7	151.63/0.3	5,461.23/11.3	42,679.11/88.7	48,140.34/100
Humphrey 3C	247.2	308.8/5.0	0	209.04/3.3	14.26/0.2	532.10/8.5	5,710.38/91.5	6,242.48/100
Tablelands	1,412.0	1,412.0/5.0	0	113.88/0.4	39.53/0.1	1,565.41/5.5	26,853.13/94.5	28,418.54/100
Coffin	155.2	61.6/5.8	0	22.88/2.1	1.89/0.2	86.37/8.1	980.37/91.9	1,066.74/100
Rice Canyon	519.2	548.0/5.3	0	709.80/6.8	38.23/0.4	1,296.03/12.5	9,053.14/87.5	10,349.17/100
Johnston-Chappuis	187.2	216.8/3.2	0	460.20/6.8	16.85/0.3	693.85/10.3	6,067.26/89.7	6,761.11/100
Shaffer Mountain	1,290.4	1,188.0/4.7	0	1,492.92/5.9	125.71/0.5	2,806.63/11.1	22,476.83/88.9	25,283.46/100
TOTALS	21,960.0	21,940.0/6.0	180.00/<0.1	15,305.68/4.2	1,024.11/0.3	38,449.79/10.5	327,874.96/89.5	366,324.75/100

1/ See APPENDIX A for description of forage allocation procedures.
2/ Cattle + Wild Horses + Deer + Antelope = Total Consumptive.
3/ Total Consumptive + Nonconsumptive = Total.

b. Reserve adequate forage for objective deer and pronghorn populations (11,100 and 1,250, respectively).

c. Reserve adequate forage for 15 wild horses in the New Ravendale Allotment.

4. Intensive Livestock Grazing (TABLE 2-1)

a. Implement Allotment Management Plans (AMPs) on 8 allotments.

b. Maintain AMPs on 3 allotments.

c. Cancel one AMP and manage the remaining 15 allotments without AMPs.

5. Selective Management (TABLE 2-1)

Categorize allotments according to similar characteristics and management needs:

- 9 Maintenance (M) allotments.
- 10 Improvement (I) allotments.
- 7 Custodial (C) allotments.

See page 2-3 for discussion of management categories.

6. Range Improvements (TABLE 2-3 and MAP 2-1)

Construct the following range improvements designed to benefit multiple use resources, improve livestock distribution, allow implementation of grazing systems, increase forage production, and reduce livestock conflicts:

- 87 miles of fence.
- 6 cattleguards.
- 3 wells (windmills).
- 60 reservoirs
- 15 spring developments.
- 76,200 acres vegetation manipulation (including 38,300 acres noxious weed control).

7. Seasonal Use Adjustments (TABLE 2-1)

a. Delay livestock turnout dates in the New Ravendale and North Horse Lake Allotments by 15 days. The existing turnout date of 04/01 falls 15 days before average range readiness for perennial rangelands.

b. Change the season of use in the Humphrey 3C Allotment from 04/01-06/30 to 03/01-05/30. This allotment is primarily annual rangeland with compaction resistant stoney soils. The earlier livestock use season would allow more efficient use of early maturing annual forage and provide a rest from grazing during May and June for regrowth.

TABLE 2-3

Proposed Range Developments
Alternative A - Proposed Action

Allotment	Fence (Miles)	Cattleguards (Each)	Windmills (Each)	Reservoirs (Each)	Spring Developments (Each)	Brush Control (Acres)	Fuel Break (Acres)	Seeding (Acres)	Noxious Weed Control (Acres)	Juniper Reduction (Acres)
Walton										
Said Valley										
Buffam-Metcalf				1						
Dry Valley										
New Bailey Creek	1	3		3	2			3,000		3,000
Williams				1						
New Ravendale	6			4	3	15,000				
N. Horse Lake	13	1		4		8,000				
Slate Creek	13.5	1		12			1,000			
Bucks Bay				2						
Hansen										
Crest	4		1	2						
Snowstorm	14	1		8	4				13,000	
Erick										
Wood							2,200			
Cottonwood				3			1,600			
Stones	0.5									
Walsh Mountain				2						
Barron				3						
S. Horse Lake	14		1	2	3		4,100		2,500	
Humphrey					1					
Tablelands	12.5		1						16,000	
Coffin										
Rice Canyon				4	1				1,200	
Johnston/Chappuis	5.0								3,200	
Shaffer	3.5			9	1				2,400	
TOTAL	87.0	6	3	60	15	23,000	8,900	3,000	38,300	3,000

c. Allow a 15 day earlier turnout date (from 04/16 to 04/01) in the Tablelands Allotment. This allotment is annual rangeland with clayey soils. Earlier livestock use would make more efficient use of earlier maturing annual forage. Use would be delayed, if soils are saturated or if perennial forage is established through noxious weed control techniques.

8. Livestock Conflict Areas (MAP 2-1)

a. Willow Creek: Fence seven linear miles of willow riparian and meadow habitat to protect wildlife, watershed, cultural and recreational values from livestock grazing impacts. Stock water would be provided at restricted areas or out of the drainage.

b. Eagle Lake: Fence four miles of shoreline to prevent livestock access to a high recreational use area. Permittees would be allowed short term trailing permits.

c. Rocky Point Campground: Prohibit livestock use except by special permit. When authorized, use would be restricted to the months of September and October.

d. Snowstorm Wetland Waterfowl Project: Fence and totally exclude livestock.

9. Grazing Practices

a. All Allotment Management Plans (AMPs) would include a grazing system which would provide periodic rest from livestock grazing.

b. AMPs would be implemented on all Improvement Allotments.

c. Wildlife habitat and watershed requirements would be considered in AMP design.

d. Plant phenology of key forage species would determine grazing system treatment schedules for AMPs.

e. On allotments without AMPs (continuously grazed), utilization of the key forage species would not exceed 50 percent (by weight) of the current year's growth. On allotments with AMPs (which provide adequate rest from grazing) utilization of the key forage species would not exceed 60 percent (by weight) of the current year's growth.

Priority and Estimated Cost of Implementation

Adjustment of livestock use levels and seasons of use would be phased in over a five year period. AMPs, monitoring, and range developments would be implemented as funds permit.

Implementation of the Proposed Action would be prioritized as follows:

1. Adjust stocking levels to grazing capacity, change seasons of use, and protect special resources (i.e., Willow Creek Canyon).

2. Develop AMPs and implement monitoring systems.

3. Develop water facilities.

4. Construct fences.

5. Implement AMPs.

6. Develop land treatments.

7. Adjust livestock use levels to grazing capacity as additional forage becomes available.

Prioritization for implementation of AMPs and construction of range developments would be based on the allotment's management category:

Improvement Allotments First Priority	Maintenance Allotments Second Priority	Custodial Allotments Third Priority
New Bailey Creek	Rice Canyon	Humphrey 3-C
Tablelands	Shaffer Mountain	Said Valley
Slate Creek	Walsh Mountain	Stone
New Ravendale	Cottonwood	Hansen
North Horse Lake	Barron	Walton
South Horse Lake	Buffam-Metcalf	Coffin
Snowstorm	Williams	Dry Valley
Crest	Erick	
Johnston-Chappuis	Wood	
Bucks Bay		

Range improvements would cost an estimated $987,800 and would consist of the following:

87 miles of fence @ $2,000/mile	$ 174,000
6 cattleguards @ $3,000 each	$ 18,000
3 windmills @ $12,000 each	$ 36,000
60 reservoirs @ $4,000 each	$ 240,000
15 spring developments @ $3,500 each	$ 52,500
23,000 acres brush control @ $4/acre 1/	$ 92,000
8,900 acres fuel break @ $1/acre	$ 8,900
3,000 acres seeding @ $16/acre	$ 48,000
38,300 acres noxious weed control @ $8/acre 2/	$ 306,400
3,000 acres juniper control @ $4/acre 1/	$ 12,000
	$ 987,800

1/ Cost based on prescribed fire.
2/ Cost based on aerial herbicide application.

ALTERNATIVE B - DECREASED LIVESTOCK USE

The objective of this alternative is to emphasize nonlivestock uses and values, particularly wildlife, recreation, watershed, and aesthetics without completely disrupting the area's social and economic livestock base.

Major Components

1. Allotment Boundary Modifications (MAP 2-2)

   Same as Alternative A - Proposed Action.

2. Grazing Permittee Adjustments (TABLE 2-4)

   Same as Alternative A - Proposed Action.

3. Forage Allocation (TABLES 2-4 and 2-5)

   a. Authorize 15,278 AUMs of livestock use (a decrease of 7,979 AUMs (34%) from present) on the 26 allotments. The excess unallocated forage (11,180 AUMs) would be available for other consumptive and nonconsumptive resources.

   b. Reserve adequate forage for objective deer and pronghorn populations (11,100 and 1,250, respectively).

   c. Reserve adequate forage for 15 wild horses in the New Ravendale Allotment.

4. Intensive Livestock Grazing (TABLE 2-4)

   AMPs would be designed to meet wildlife and other non-livestock objectives.

   a. Implement AMPs on 9 allotments.

   b. Maintain AMPs on 3 allotments.

   c. Manage the remaining 14 allotments without AMPs.

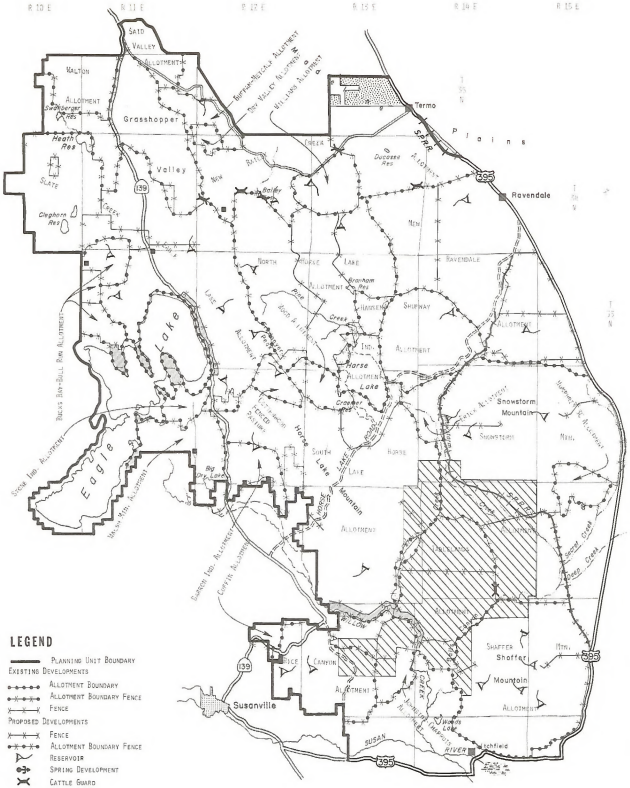
5. Selective Management (TABLE 2-4)

   Same as Alternative A - Proposed Action.

6. Range Improvements (TABLE 2-6 and MAP 2-2)

   Construct the following projects designed primarily to benefit non-livestock resources:

   - 84.5 miles of fence.
   - 6 cattleguards.
   - 31 reservoirs.
   - 41,300 acres of vegetation manipulation (includes 38,300 acres noxious weed control).



LEGEND

- Planning Unit Boundary

Existing Developments

- Allotment Boundary
- Allotment Boundary Fence
- Fence

Proposed Developments

- Fence
- Allotment Boundary Fence
- Reservoir
- Spring Development
- Cattle Guard
- Pit
- Seeding Area
- Noxious Weed Control Area
- Livestock Restriction Area

WILLOW CREEK
PLANNING UNIT
PROPOSED ALLOTMENTS AND RANGE DEVELOPMENTS

ALTERNATIVE B
DECREASED LIVESTOCK USE

2·2

TABLE 2-4

Livestock Forage Allocation and Management
Alternative B - Decreased Livestock Use

Allotment	Suitability (Acres/AUMs) Total	Unsuitable	Potentially Suitable	Suitable	Proposed Use (AUMs)	Difference[1/] (AUMs/Percent)	No. Permit-tees	Use Season	Management Category	Type Manage-ment
Walton	930/73			930/73	63	+10/13	1	06/01-09/30	Custodial	Non-AMP
Said Valley	1,545/221	46/7	77/11	1,422/203	140	+63/31	1	06/01-09/30	Custodial	Non-AMP
Buffam-Metcalf	4,165/300	14/<1	346/25	3,805/274	200	+74/63	1	06/01-09/30	Maintenance	Non-AMP
Dry Valley	453/53			453/53	12	+41/77	1	06/01-09/30	Custodial	Non-AMP
New Bailey Creek	15,569/1,745	494/46	210/20	14,865/1,679	1,411	+268/16	3	06/01-09/15	Improvement	AMP
Williams	3,058/478	136/21		2,922/457	332	+125/27	1	06/01-09/30	Maintenance	Non-AMP
New Ravendale	32,477/3,092	234/22	2,264/198	29,979/2,872	1,684	+1,188/41	1	06/01-09/30	Improvement	AMP
N. Horse Lake	26,874/2,846	438/46	782/86	25,654/2,714	1,344	+1,370/51	2	06/01-09/30	Improvement	AMP
Slate Creek	27,529/3,196	544/44	2,846/172[2/]	24,139/2,980	1,516	+1,464/51	4	06/01-09/30	Improvement	AMP
Bucks Bay	5,154/753	170/25	400/30[3/]	4,584/698	585	+113/16	1	06/01-09/15	Improvement	AMP
Hansen	1,263/175		107/15	1,156/160	88	+72/45	1	06/01-09/15	Custodial	Non-AMP
Crest	11,835/825			11,835/825	152	+673/82	1	06/01-09/30	Improvement	AMP
Snowstorm	43,681/4,651	4/<1	148/13	43,529/4,638	2,705	+1,933/42	1	04/01-08/30	Improvement	AMP
Erick	2,475/218	50/4	124/11	2,301/203	138	+65/32	1	05/01-07/30	Maintenance	Non-AMP
Wood	2,189/234	17/2		2,172/232	207	+25/11	1	06/01-09/15	Maintenance	AMP
Cottonwood	1,692/142			1,692/142	22	+120/85	1	06/01-07/30	Maintenance	Non-AMP
Stone	882/87	26/3	549/42[4/]	307/42	20	+22/52	1	05/01-08/30	Custodial	Non-AMP
Walsh Mountain	4,780/342	53/4	1,004/72[5/]	3,723/266	174	+92/35	1	05/01-07/30	Maintenance	Non-AMP
Barron	4,309/203	266/12	1,205/57	2,838/134	80	+54/40	1	05/01-08/31	Maintenance	Non-AMP
S. Horse Lake	41,669/3,580	899/77	4,017/344[6/]	36,753/3,159	1,453	+1,706/54	6	06/16-08/31	Improvement	AMP
Humphrey 3C	5,096/573		1,661/187	3,435/386	256	+130/34	3	04/01-05/30	Custodial	Non-AMP
Tablelands	16,260/1,772	163/7	106/3[7/]	15,991/1,762	678	+1,084/62	4	04/01-05/30	Improvement	AMP
Coffin	1,062/103	265/26		797/77	74	+3/4	1	04/16-06/24	Custodial	Non-AMP
Rice Canyon	10,800/931	797/69	2,055/177	7,948/685	504	+181/26	4	04/16-07/30	Maintenance	Non-AMP
Johnston-Chappuis	6,768/286	82/4	527/24[8/]	6,159/258	150	+109/42	1	04/16-06/30	Improvement	AMP
Shaffer Mountain	24,463/1,760	1,905/137	2,433/138	20,125/1,485	1,290	+195/13	2	04/16-06/30	Improvement	AMP
TOTALS	296,978/28,639	6,603/557	20,861/1,625	269,514/26,457	15,278	+11,180/42				

1/ Difference between suitable forage and proposed use. Positive values indicate suitable forage would be greater than proposed use. See APPENDIX A for description of forage allocation procedures.
2/ 651 acres/18 AUMs unavailable due to livestock exclusion.
3/ 400 acres/30 AUMs unavailable due to livestock exclusion.
4/ 529 acres/40 AUMs unavailable due to livestock exclusion.
5/ 240 acres/17 AUMs unavailable due to livestock exclusion.
6/ 95 acres/7 AUMs unavailable due to livestock exclusion.
7/ 106 acres/3 AUMs unavailable due to livestock exclusion.
8/ 237 acres/12 AUMs unavailable due to livestock exclusion.

TABLE 2-5

Vegetation Production Allocation[1/]
Alternative B - Decreased Livestock Use

ALLOTMENT	CATTLE Allocated[1/] (1000 lbs.)	CATTLE Available[2/] (1000 lbs./%)	WILD HORSES[2/] (1000 lbs./%)	DEER[2/] (1000 lbs./%)	PRONGHORN[2/] (1000 lbs./%)	TOTAL CONSUMPTIVE[2/3/] (1000 lbs./%)	NONCONSUMPTIVE[3/] (1000 lbs./%)	TOTAL[3/] (1000 lbs./%)
Walton	50.4	58.4/9.2	0	30.16/4.8	3.02/0.5	91.58/14.5	542.37/85.5	633.95/100
Said Valley	112.0	162.4/8.2	0	48.88/2.4	4.54/0.2	215.82/10.8	1,775.37/89.2	1,991.19/100
Buffam-Metcalf	160.0	219.2/5.3	0	52.00/1.2	11.34/0.3	282.54/6.8	3,867.21/93.2	4,149.75/100
Dry Valley	9.6	42.4/9.5	0	14.56/3.3	0.76/0.2	57.72/13.0	386.50/87.0	444.22/100
New Bailey Creek	1,128.8	1,343.2/5.5	0	771.68/3.2	34.02/0.1	2,148.90/8.8	22,243.77/91.2	24,392.67/100
Williams	265.6	365.6/9.5	0	98.80/2.6	6.05/0.2	470.45/12.3	3,363.01/87.7	3,833.46/100
New Ravendale	1,347.2	2,297.6/5.9	180.00/0.5	1,357.20/3.5	144.50/0.4	3,979.30/10.3	34,854.39/89.7	38,833.69/100
North Horse Lake	1,075.2	2,171.2/6.2	0	1,357.20/3.9	71.06/0.2	3,599.46/10.3	31,186.94/89.7	34,786.40/100
Slate Creek	1,212.8	1,556.8/4.2	0	1,461.20/4.0	88.45/0.3	3,106.45/8.5	33,500.67/91.5	36,607.12/100
Bucks Bay	468.0	558.4/7.5	0	336.96/4.5	8.32/0.1	903.68/12.1	6,546.19/87.9	7,449.87/100
Hansen	70.4	128.0/6.6	0	111.28/5.7	7.56/0.4	246.84/12.7	1,691.48/87.3	1,938.32/100
Crest	121.6	660.0/4.3	0	359.84/2.3	21.38/0.1	1,041.22/6.7	14,329.04/93.3	15,370.26/100
Snowstorm	2,164.0	3,710.4/7.2	0	2,934.36/5.7	197.64/0.3	6,842.40/13.2	44,824.11/86.8	51,666.51/100
Erick	110.4	162.4/7.1	0	61.36/2.7	7.13/0.3	230.89/10.2	2,026.53/89.8	2,257.42/100
Wood	165.6	185.6/4.6	0	123.76/3.1	4.54/0.1	313.90/7.8	3,661.08/92.2	3,974.98/100
Cottonwood	17.6	113.6/4.0	0	116.48/4.1	9.45/0.3	239.53/8.4	2,608.82/91.6	2,848.35/100
Stone	16.0	33.6/5.5	0	34.32/5.5	3.02/0.5	70.94/11.5	545.64/88.5	616.58/100
Walsh Mountain	139.2	212.8/5.0	0	166.92/3.9	8.32/0.2	388.04/9.1	3,897.24/90.9	4,285.28/100
Barron	64.0	107.2/2.7	0	83.20/2.1	4.91/0.1	195.31/4.9	3,787.58/95.1	3,982.89/100
South Horse Lake	1,162.4	2,527.2/5.3	0	2,776.80/5.7	151.63/0.3	5,455.63/11.3	42,684.71/88.7	48,140.34/100
Humphrey 3C	204.8	308.8/5.0	0	209.04/3.3	14.26/0.2	532.10/8.5	5,710.38/91.5	6,242.48/100
Tablelands	542.4	1,409.6/5.0	0	113.88/0.4	39.53/0.1	1,563.01/5.5	26,855.53/94.5	28,418.54/100
Coffin	61.6	59.2/5.5	0	22.88/2.1	1.89/0.2	83.97/7.8	982.77/92.2	1,066.74/100
Rice Canyon	403.2	548.0/5.2	0	709.80/6.9	38.23/0.4	1,296.03/12.5	9,053.14/87.5	10,349.17/100
Johnston-Chappuis	120.0	206.4/3.0	0	460.20/6.8	16.85/0.3	683.45/10.1	6,077.66/89.9	6,761.11/100
Shaffer Mountain	1,032.0	1,188.0/4.7	0	1,492.92/5.9	125.71/0.5	2,806.63/11.1	22,476.83/88.9	25,283.46/100
TOTALS	12,224.8	20,336.0/5.6	180.00/<0.1	15,305.68/4.2	1,024.11/0.3	36,845.79/10.1	329,478.96/89.9	366,324.75/100

1/ See APPENDIX A for description of forage allocation procedures.
2/ Cattle + Wild Horses + Deer + Antelope = Total Consumptive.
3/ Total Consumptive + Nonconsumptive = Total.

TABLE 2-6

Proposed Range Developments
Alternative B - Decreased Livestock Use

Allotment	Fence (Miles)	Cattleguards (Each)	Windmills (Each)	Reservoirs (Each)	Spring Developments (Each)	Brush Control (Acres)	Fuel Break (Acres)	Seeding (Acres)	Noxious Weed Control (Acres)	Juniper Reduction (Acres)
Walton										
Said Valley										
Buffam-Metcalf				1						
Dry Valley										
New Bailey Creek	1	3		1				3,000		
Williams				1						
New Ravendale	6			2						
N. Horse Lake	13	1		2						
Slate Creek										
Eagle Lake	13.5	1		6						
Bucks Bay	1			2						
Hansen										
Crest	4									
Snowstorm	14	1		3					13,000	
Erick										
Wood										
Cottonwood				1						
Stones	1									
Walsh Mountain	0.5			1						
Barron				1						
S. Horse Lake	14			3					2,500	
Humphrey										
Tablelands	8								16,000	
Coffin										
Rice Canyon				2					1,200	
Johnston/Chappuis	5								3,200	
Shaffer	3.5			5					2,400	
TOTAL	84.5	6		31				3,000	38,300	

7. Livestock Seasonal Use Adjustments (TABLE 2-4)

   a. Delay spring turnout 15 to 75 days on 23 allotments to favor deer and pronghorn fawning and kidding habitat.

   b. Remove livestock from 23 allotments between 15 and 135 days earlier to favor deer and pronghorn winter range.

8. Livestock Conflict Areas (MAP 2-2)

   a. Willow Creek: Fence and exclude livestock grazing along seven linear miles of willow riparian habitat for the protection of wildlife, watershed, cultural and recreation values. No stock water access would be allowed.

   b. Eagle Lake: Fence and exclude livestock grazing along the entire 23 miles of BLM shoreline, including Rocky Point Campground, for the protection of recreation, water quality, wildlife, scenic values, and cultural resources. No stock water access would be allowed.

   c. Snowstorm Wetland Waterfowl Project: Fence and totally exclude livestock grazing.

9. Grazing Practices

   AMPs would be designed primarily to benefit wildlife habitat, watershed requirements, and other non-livestock resources. Grazing practices a-e (page 2-11) for the Proposed Action would also apply to this alternative.

Priority and Estimated Cost of Implementation

Phase-in period and priority of implementation would be the same as for the Proposed Action. Range improvements would cost an estimated $665,400 and would consist of the following:

84.5 miles of fence @ $2,000/mile	$169,000
6 cattleguards @ $3,000 each	$ 18,000
31 reservoirs @ $4,000 each	$124,000
3,000 acres seeding @ $16/acre	$ 48,000
38,300 acres noxious weed control @ $8/acre 1/	$306,400
	$665,400

1/ Cost based on aerial herbicide application.

ALTERNATIVE C - INCREASED LIVESTOCK USE

The objective of this alternative is to allow a higher level of livestock use by maximizing the potential of the rangeland resource and giving priority to livestock over other competitive resources.

Major Components

1. Allotment Boundary Modification (MAP 2-3)

   Same as Alternative A - Proposed Action.

2. Grazing Permittee Adjustments (TABLE 2-7)

   Same as Alternative A - Proposed Action.

3. Forage Allocation (TABLES 2-7 and 2-8)

   a. Authorize 30,874 AUMs of livestock use (an increase of 7,617 AUMs over present levels) including:

      - An increase of 8,051 AUMs on 14 allotments. 6,695 AUMs of this increase would result from the proposed vegetation treatments and would not be authorized until after the projects are developed and additional forage is produced.
      - A decrease of 434 AUMs on two allotments.
      - Maintenance of existing use on 10 allotments.

   b. Reserve adequate forage for existing deer (6,600 resident) and pronghorn (800 resident) populations.

   c. Reserve adequate forage for 15 wild horses in the New Ravendale Allotment.

4. Intensive Livestock Grazing (TABLE 2-7)

   a. Implement AMPs on 16 allotments.

   b. Maintain AMPs on 4 allotments.

   c. Manage the remaining 6 allotments without AMPs.

   d. Design AMPs to primarily benefit livestock grazing.

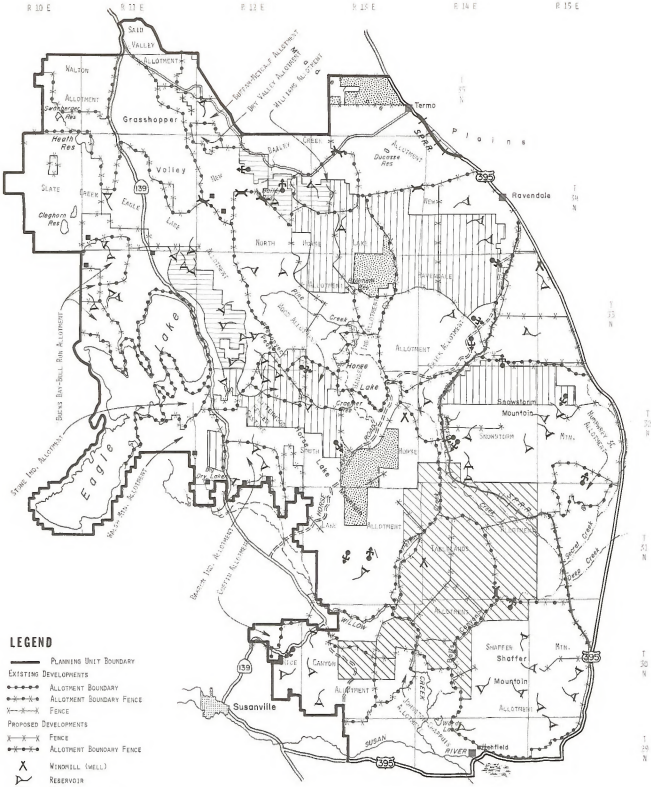
5. Selective Management (TABLE 2-7)

   Same as Alternative A - Proposed Action.

6. Range Improvements (TABLES 2-9 and MAP 2-3)

   Develop the following range improvements designed primarily to improve livestock distribution and forage production, and to allow implementation of grazing systems.

   - 90 miles of fence.
   - 6 cattleguards.
   - 3 wells (windmills).
   - 61 reservoirs.
   - 15 spring developments.
   - 105,800 acres of vegetation manipulation (including 38,300 acres noxious weed control).



WILLOW CREEK
PLANNING UNIT
PROPOSED ALLOTMENTS AND RANGE DEVELOPMENTS

ALTERNATIVE C
INCREASED LIVESTOCK USE

TABLE 2-7

Livestock Forage Allocation and Management
Alternative C - Increased Livestock Use

Allotment	Suitability (Acres/AUMs) Total	Unsuitable	Potentially Suitable	Suitable	Proposed Use (AUMs)	Difference[1/] (AUMs/Percent)	No. Permit-tees	Use Season	Management Category	Type Manage-ment
Walton	930/73			930/73	94	-21/29	1	05/01-10/31	Custodial	AMP
Said Valley	1,545/221	46/7	77/11	1,422/203	232	-29/14	1	04/16-10/31	Custodial	Non-AMP
Buffam-Metcalf	4,165/300	14/<1	346/25	3,805/274	246	+28/10	1	05/15-10/11	Maintenance	AMP
Dry Valley	453/53			453/53	42	+11/20	1	04/16-10/31	Custodial	Non-AMP
New Bailey Creek	15,569/2,094	494/46	210/20	14,865/2,028	2,033	-5/<1	3	04/16-10/31	Improvement	AMP
Williams	3,058/736	136/21		2,922/715	715	0	1	05/16-10/31	Maintenance	AMP
New Ravendale	32,477/3,991	234/22	2,264/198	29,979/3,771	3,771	0	1	04/15-10/31	Improvement	AMP
N. Horse Lake	26,874/3,873	438/46	782/86	25,654/3,741	3,741	0	2	04/01-10/31	Improvement	AMP
Slate Creek	27,529/3,196	544/44	2,195/154	24,790/2,998	2,998	0	3	04/16-10/31	Improvement	AMP
Bucks Bay	5,154/753	170/25		4,984/728	840	-112/15	1	05/01-09/30	Improvement	AMP
Hansen	1,263/175		107/15	1,156/160	129	+31/19	1	04/16-09/15	Custodial	Non-AMP
Crest	11,835/825			11,835/825	660	+165/20	1	05/16-09/15	Improvement	AMP
Snowstorm	43,681/5,118	4/<1	148/13	43,529/5,105	5,105	0	3	04/01-10/31	Improvement	AMP
Erick	2,475/218	50/4	124/11	2,301/203	230	-27/13	1	04/16-09/15	Maintenance	AMP
Wood	2,189/362	17/2		2,172/360	360	0	1	05/01-09/30	Maintenance	AMP
Cottonwood	1,692/235			1,692/235	235	0	1	05/10-08/09	Maintenance	AMP
Stone	882/87	26/3	20/2	836/82	66	+16/20	1	04/01-12/31	Custodial	Non-AMP
Walsh Mountain	4,780/412	53/4	764/55	3,963/353	353	0	1	04/16-09/15	Maintenance	AMP
Barron	4,309/203	266/12	1,205/57	2,838/134	122	+12/9	1	04/01-09/30	Maintenance	AMP
S. Horse Lake	41,669/4,552	899/77	3,922/337	36,848/4,138	4,138	0	7	04/01-08/31	Improvement	AMP
Humphrey 3C	5,096/573		1,661/187	3,435/386	309	+77/20	3	03/01-05/30	Custodial	Non-AMP
Tablelands	16,260/1,772	163/7		16,097/1,765	1,765	0	4	04/01-10/15	Improvement	AMP
Coffin	1,062/103	265/26		797/77	194	-117/152	1	05/01-10/31	Custodial	Non-AMP
Rice Canyon	10,800/931	797/69	2,055/177	7,948/685	649	+36/5	4	04/01-08/31	Maintenance	AMP
Johnston-Chappuis	6,768/287	82/4	290/12	6,396/271	234	+37/14	1	04/16-06/30	Improvement	AMP
Shaffer Mountain	24,463/1,760	1,905/137	2,433/175	20,125/1,448	1,613	-165/11	2	04/01-08/31	Improvement	AMP
TOTALS	296,978/32,903	6,603/557	18,603/1,535	271,772/30,811	30,874	-63/<1				

1/ Difference between suitable forage and proposed use. Negative values indicate suitable forage would be less than proposed use; positive values indicate suitable forage would be greater than proposed use. See APPENDIX A for description of forage allocation procedures.

TABLE 2-8

Vegetation Production Allocation[1/]
Alternative C - Increased Livestock Use

ALLOTMENT	CATTLE Allocated[1/] (1000 lbs.)	CATTLE Available[2/] (1000 lbs./%)	WILD HORSES[2/] (1000 lbs./%)	DEER[2/] (1000 lbs./%)	PRONCHORN[2/] (1000 lbs./%)	TOTAL CONSUMPTIVE[2/3/] (1000 lbs./%)	NONCONSUMPTIVE[3/] (1000 lbs./%)	TOTAL[3/] (1000 lbs./%)
Walton	75.2	58.4/9.2	0	17.68/2.8	1.89/0.3	77.97/12.3	555.98/87.7	633.95/100
Said Valley	185.6	162.4/8.1	0	29.12/1.5	3.02/0.2	194.54/9.8	1,796.64/90.2	1,991.18/100
Buffam-Metcalf	196.8	219.2/5.3	0	31.20/0.7	7.18/0.2	257.58/6.2	3,892.17/93.8	4,149.75/100
Dry Valley	33.6	42.4/9.5	0	8.32/1.9	0.38/0.1	51.10/11.5	393.12/88.5	444.22/100
New Bailey Creek	1,626.4	1,622.4/6.6	0	455.52/1.9	21.92/0.1	2,099.84/8.6	22,292.83/91.4	24,392.67/100
Williams	572.0	572.0/14.9	0	58.24/1.5	3.78/0.1	634.02/16.5	3,199.44/83.5	3,833.46/100
New Ravendale	3,016.8	3,016.8/7.8	180.00/0.5	800.80/2.1	92.67/0.2	4,090.27/10.6	34,743.42/89.4	38,833.69/100
North Horse Lake	2,992.8	2,992.8/8.6	0	800.80/2.3	45.36/0.1	3,838.96/11.0	30,947.44/89.0	34,786.40/100
Slate Creek	2,398.4	2,398.4/6.6	0	862.16/2.4	56.70/0.1	3,317.26/9.1	33,289.86/90.9	36,607.12/100
Bucks Bay	659.2	582.4/7.8	0	198.64/2.7	5.29/0.1	786.33/10.6	6,663.54/89.4	7,449.87/100
Hansen	103.2	128.0/6.6	0	65.52/3.4	4.91/0.3	198.43/10.2	1,739.89/89.8	1,938.32/100
Crest	528.0	660.0/4.3	0	212.16/1.4	13.61/<0.1	885.77/5.8	14,484.49/94.2	15,370.26/100
Snowstorm	4,084.0	4,084.0/7.9	0	1,731.60/3.4	126.36/0.2	5,941.96/11.5	45,724.55/88.5	51,666.51/100
Erick	184.0	162.4/7.2	0	36.40/1.6	4.54/0.2	203.34/9.0	2,054.08/91.0	2,257.42/100
Wood	288.0	288.0/7.3	0	72.80/1.8	3.02/0.1	363.82/9.2	3,611.16/90.8	3,974.98/100
Cottonwood	188.0	188.0/6.6	0	68.64/2.4	6.05/0.2	262.69/9.2	2,585.66/90.8	2,848.35/100
Stone	52.8	65.6/10.6	0	20.28/3.3	1.89/0.3	87.77/14.2	528.81/85.8	616.58/100
Walsh Mountain	202.4	202.4/4.7	0	98.28/2.3	5.29/0.1	305.97/7.1	3,979.31/92.9	4,285.28/100
Barron	97.6	107.2/2.7	0	48.88/1.2	3.02/0.1	159.10/4.0	3,823.79/96.0	3,982.89/100
South Horse Lake	3,310.4	3,310.4/6.9	0	1,638.00/3.4	97.20/0.2	5,045.60/10.5	43,094.74/89.5	48,140.34/100
Humphrey 3C	247.2	308.8/4.9	0	123.24/2.0	9.07/0.2	441.11/7.1	5,801.37/92.9	6,242.48/100
Tablelands	1,412.0	1,412.0/5.0	0	67.08/0.2	25.27/0.1	1,504.35/5.3	26,914.19/94.7	28,418.54/100
Coffin	155.2	61.6/5.8	0	13.52/1.3	1.13/0.1	76.25/7.2	990.49/92.8	1,066.74/100
Rice Canyon	519.2	548.0/5.3	0	382.20/3.69	24.62/0.24	954.82/9.23	9,394.35/90.77	10,349.17/100
Johnston-Chappuis	187.2	216.8/3.21	0	436.80/6.46	11.02/0.16	664.62/9.8	6,096.49/90.2	6,761.11/100
Shaffer Mountain	1,290.4	1,158.4/4.58	0	751.92/2.97	80.35/0.32	1,990.67/7.9	23,292.79/92.1	25,283.46/100
TOTALS	24,606.4	24,568.8/6.7	180.00/<0.1	9,029.80/2.5	655.54/0.2	34,434.14/9.4	331,890.60/90.6	366,324.74/100

1/ See APPENDIX A for description of forage allocation procedures.
2/ Cattle + Wild Horses + Deer + Antelope = Total Consumptive.
3/ Total Consumptive + Nonconsumptive = Total.

Proposed Range Developments
Alternative C - Increased Livestock Use

Allotment	Fence (Miles)	Cattleguards (Each)	Windmills (Each)	Reservoirs (Each)	Spring Developments (Each)	Brush Control (Acres)	Fuel Break (Acres)	Seeding (Acres)	Noxious Weed Control (Acres)	Juniper Reduction (Acres)
Walton										
Said Valley										
Buffam-Metcalf	1.5			1						
Dry Valley										
New Bailey Creek	1	3		3	2			3,000		3,000
Williams	2			1		1,200				2,500
New Revendale	6			4	3	15,000				
N. Horse Lake	13	1		4		8,000 1/		4,200		
Slate Creek	13.5	1		12		1,000 1/				7,000
Bucks Bay				2						
Hansen										
Crest	4		1	2						
Snowstorm	14	1		8	4	8,000			13,000	
Erick				1						
Wood						2,200 1/				
Cottonwood				3		1,600 1/				
Stones										
Walsh Mountain				2		1,200				
Barron				3						
S. Horse Lake	14		1	2	3	4,100 1/		5,500	2,500	
Humphrey					1					
Tablelands	12.5		1						16,000	
Coffin										
Rice Canyon				4	1				1,200	
Johnston/Chappuis	5								3,200	
Shaffer	3.5			9	1				2,400	
TOTAL	90	6	3	61	15	42,300		12,700	38,300	12,500

1/ Would also reduce fire hazard.

7. Livestock Seasonal Use Adjustments (TABLES 2-7)

   a. Maintain the existing turnout date of 04/01 in the New Ravendale and North Horse Lake Allotments.

   b. Change the season of use in the Humphrey 3C Allotment from 04/01-06/30 to 03/01-06/30.

   c. Allow a 15 day earlier turnout date (04/01 rather than 04/16) in the Tablelands Allotment.

8. Livestock Conflict Areas

   Allow unlimited access by livestock to all conflict areas.

9. Grazing Practices

   a. All AMPs would include a grazing system which would provide periodic rest from livestock grazing.

   b. AMPs would be implemented on all feasible allotments.

   c. AMPs would be designed primarily to benefit livestock forage.

   d. Plant phenology of key forage species would determine grazing system treatment schedules for AMPs.

   e. Utilization of key native species would not exceed 60 percent (by weight) of current year's growth.

Priority and Estimated Cost of Implementation

Phase-in period and priority of implementation would be the same as for the Proposed Action. Range improvements would cost an estimated $1,259,300 and would consist of the following:

90 miles of fence @ $2,000/mile	$ 180,000
6 cattleguards @ $3,000 each	$ 18,000
3 windmills @ $12,000 each	$ 36,000
61 reservoirs @ $4,000 each	$ 244,000
15 spring developments @ $3,500 each	$ 52,500
42,300 acres brush control @ $4/acre 1/	$ 169,200
12,700 acres seeding @ $16/acre	$ 203,200
38,300 acres noxious weed control @ $8/acre 2/	$ 306,400
12,500 acres juniper reduction @ $4/acre 1/	$ 50,000
	$1,259,300

1/ Cost based on prescribed fire.
2/ Cost based on aerial herbicide application.

ALTERNATIVE D - NO ACTION

The objective of this alternative is to preserve the status quo for livestock grazing management.

Major Components

1. Allotment boundaries would not change (MAP 2-4).

2. Forage would be allocated to livestock at existing grazing preference, numbers, and season (TABLES 2-10 and 2-11).

3. Forage would be allocated to existing wild horses (15 yearlong), deer (6,600 resident) and pronghorn (800 resident) (TABLES 2-10 and 2-11).

4. New AMPs would not be developed.

5. New livestock range developments would not be proposed.

6. Existing range developments would be maintained (TABLE 2-12 and MAP 2-4).

7. No major grazing adjustments would be made based on other resource values.

8. No change in present grazing management practices.

ALTERNATIVE E - NO GRAZING

The objective of this alternative is to allow the environment to respond to its full potential without the influence of livestock grazing.

Major Components

1. Cancel all livestock grazing permits in the planning unit.

2. Manage for objective deer (11,100) and pronghorn (1,250) populations (see Proposed Action)(TABLE 2-13).

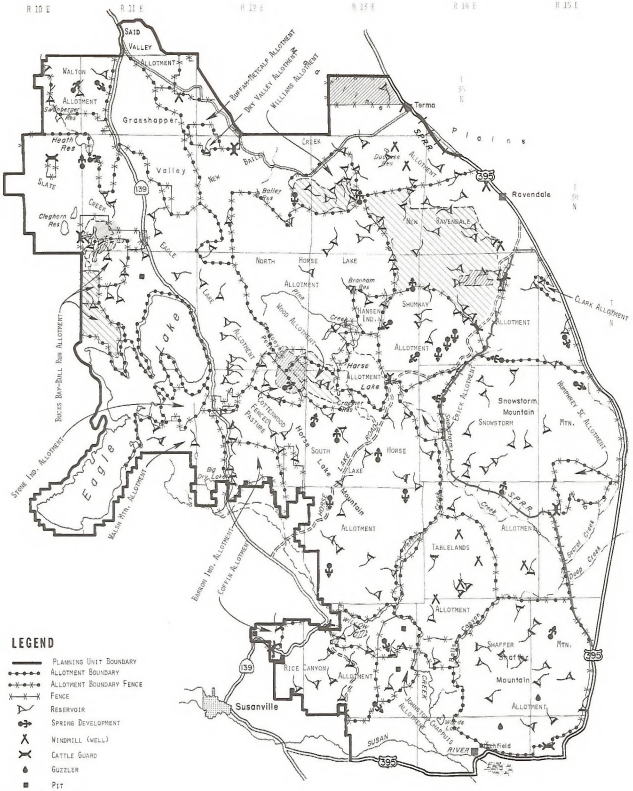
3. Manage wild horses in the New Ravendale Allotment at present numbers (15 yearlong)(TABLE 2-13).

4. Construct and maintain improvements only to benefit nonlivestock resources.

GENERAL MANAGEMENT DESCRIPTIONS

Standard Operating Procedures

Allotment Management Plans (AMPs) developed to implement grazing management decisions would include range developments and vegetation manipulations, as appropriate. Standard operating procedures for implementation of the range developments would include the following:



WILLOW CREEK
PLANNING UNIT
EXISTING ALLOTMENTS AND RANGE DEVELOPMENTS

ALTERNATIVE D
NO ACTION

TABLE 2-10

Livestock Forage Allocation and Management
Alternative D - No Action

Allotment	Suitability (Acres/AUMs) Total	Unsuitable	Potentially Suitable	Suitable	Proposed Use (AUMs)	Difference[1/] (AUMs/Percent)	No. Permit-tees	Use Season	Type Manage-ment
Walton	930/73			930/73	94	-21/29	1	05/01-10/31	Non-AMP
Said Valley	1,545/221	46/7	77/11	1,422/203	232	-29/14	1	04/16-10/31	Non-AMP
Buffam-Metcalf	4,165/300	14/<1	346/25	3,805/274	246	+28/10	1	05/15-10/11	Non-AMP
Dry Valley	453/53			453/53	24	+29/55	1	04/16-10/31	Non-AMP
New Bailey Creek	16,569/1,545	494/46	210/20	15,865/1,479	2,033	-554/38	3	04/16-10/31	Non-AMP
Williams	3,058/478	136/21		2,922/457	519	-62/14	1	05/16-10/31	Non-AMP
New Ravendale	33,533/2,926		1,114/91	32,419/2,835	1,944	+891/31	2	04/01-10/31	Non-AMP
N. Horse Lake	26,874/2,846	438/46	1,332/141	25,104/2,659	1,968	+691/26	2	04/01-10/31	Non-AMP
Slate Creek	26,529/2,144	544/44	3,395/274	22,590/1,826	2,066	-240/13	4	04/10-10/31	Non-AMP
Bucks Bay	5,154/753	170/25		4,984/728	840	-112/15	1	05/01-09/30	AMP
Hansen	1,263/175		107/15	1,156/160	129	+31/19	1	04/16-09/15	Non-AMP
Shumway	10,607/991	234/22	1,150/107	9,223/862	1,046	-184/21	1	04/01-10/31	Non-AMP
Clark	172/25			172/25	12	+13/52	1	05/16-09/15	Non-AMP
Snowstorm	43,681/3,798	4/<1	148/13	43,529/3,785	3,605	+180/5	3	04/01-10/31	Non-AMP
Erick	2,475/218	50/4	124/11	2,301/203	230	-27/13	1	04/16-09/15	Non-AMP
Wood	2,189/234	17/2		2,172/232	253	-21/9	1	05/01-09/30	AMP
Cottonwood	1,692/142			1,692/142	33	+109/77	1	05/10-08/09	Non-AMP
Stone	882/87	26/3	20/2	836/82	50	+32/39	1	04/01-12/31	Non-AMP
Walsh Mountain	4,780/342	53/4	764/55	3,963/283	291	-8/3	1	04/16-09/15	Non-AMP
Barron	4,309/203	266/12	1,205/57	2,838/134	122	+12/9	1	04/01-09/30	Non-AMP
S. Horse Lake	41,669/3,580	899/77	3,922/337	36,848/3,166	2,759	+407/13	6	04/01-08/31	Non-AMP
Humphrey 3C	5,096/573		1,661/187	3,435/386	309	+77/20	3	04/01-06/30	Non-AMP
Tablelands	16,260/721	163/7		16,097/714	1,328	-614/83	4	04/16-10/15	Non-AMP
Coffin	1,062/103	265/26		797/77	194	-117/152	1	05/01-10/31	Non-AMP
Rice Canyon	10,800/931	797/69	2,055/177	7,948/685	715	-30/5	5	04/01-08/31	Non-AMP
Johnston-Chappuis	6,768/287	82/4	290/12	6,396/271	602	-331/122	2	04/16-06/30	AMP
Shaffer Mountain	24,463/1,760	1,905/137	2,433/175	20,125/1,448	1,613	-165/11	2	04/01-08/31	Non-AMP
TOTALS	296,978/25,509	6,603/557	20,353/1,710	270,022/23,242	23,257	-15/ <0.1			

1/ Difference between suitable forage and proposed use. Negative values indicate suitable forage would be less than proposed use; positive values indicate suitable forage would be greater than proposed use. See APPENDIX A for description of forage allocation procedures.

TABLE 2-11

Vegetation Production Allocation[1/]
Alternative D - No Action

ALLOTMENT	CATTLE Allocated[1/] (1000 lbs.)	CATTLE Available[2/] (1000 lbs./%)	WILD HORSES[2/] (1000 lbs./%)	DEER[2/] (1000 lbs./%)	PRONGHORN[2/] (1000 lbs./%)	TOTAL CONSUMPTIVE[2/3/] (1000 lbs./%)	NONCONSUMPTIVE[3/] (1000 lbs./%)	TOTAL[3/] (1000 lbs./%)
Walton	75.2	58.4/9.2	0	17.68/2.8	1.89/0.3	77.97/12.3	555.98/87.7	633.95/100
Said Valley	185.6	162.4/8.1	0	29.12/1.5	3.02/0.2	194.54/9.8	1,796.64/90.2	1,991.18/100
Buffam-Metcalf	196.8	219.2/5.3	0	31.20/0.8	7.18/0.2	257.58/6.2	3,892.17/93.8	4,149.75/100
Dry Valley	19.2	42.4/9.5	0	8.32/1.9	0.38/0.1	51.10/11.5	393.12/88.5	444.22/100
New Bailey Creek	1,626.4	1,183.2/4.6	0	455.52/1.8	21.92/0.1	1,660.64/6.5	23,897.95/93.5	25,558.59/100
Williams	415.2	365.6/9.5	0	58.24/1.6	3.78/0.1	427.62/11.2	3,405.84/88.8	3,833.46/100
New Ravendale	1,555.2	2,268.0/5.3	180.00/0.4	863.20/2.0	83.59/0.2	3,394.79/7.9	39,450.95/92.1	42,845.74/100
North Horse Lake	1,574.4	2,127.2/6.1	0	800.80/2.3	45.36/0.1	2,973.36/8.5	31,813.04/91.5	34,786.40/100
Slate Creek	1,652.8	1,460.8/4.1	0	862.16/2.4	56.70/0.2	2,379.66/6.7	33,061.54/93.3	35,441.20/100
Bucks Bay	672.0	582.4/7.8	0	198.64/2.7	5.29/0.1	786.33/10.6	6,663.54/89.4	7,449.87/100
Hansen	103.2	128.0/6.6	0	65.52/3.4	4.91/0.3	198.43/10.2	1,739.89/89.8	1,938.32/100
Shumway	836.8	689.5/6.4	0	145.60/1.4	22.03/0.2	857.13/8.0	9,830.01/92.0	10,687.14/100
Clark	9.6	20.0/3.0	0	4.16/0.6	0.65/0.1	24.81/3.7	646.26/96.3	671.07/100
Snowstorm	2,884.0	3,028.0/5.9	0	1,731.60/3.4	126.36/0.2	4,885.96/9.5	46,780.55/90.5	51,666.51/100
Erick	184.0	162.4/7.2	0	36.40/1.6	4.54/0.2	203.34/9.0	2,054.08/91.0	2,257.42/100
Wood	202.4	185.6/4.7	0	72.80/1.8	3.02/0.1	261.42/6.6	3,713.56/93.4	3,974.98/100
Cottonwood	26.4	113.6/4.0	0	68.64/2.4	6.05/0.2	188.29/6.6	2,660.06/93.4	2,848.35/100
Stone	40.0	65.6/10.6	0	20.28/3.3	1.89/0.3	87.77/14.2	528.81/85.8	616.58/100
Walsh Mountain	232.8	226.4/5.3	0	98.28/2.3	5.29/0.1	329.97/7.7	3,955.31/92.3	4,285.28/100
Barron	97.6	107.2/2.7	0	48.88/1.2	3.02/0.1	159.10/4.0	3,823.79/96.0	3,982.89/100
South Horse Lake	2,207.2	2,532.8/5.3	0	1,638.00/3.4	97.20/0.2	4,268.00/8.9	43,872.34/91.1	48,140.34/100
Humphrey 3C	247.2	308.8/5.0	0	123.24/2.0	9.07/0.1	441.11/7.1	5,801.37/92.9	6,242.48/100
Tablelands	1,062.4	571.2/2.0	0	67.08/0.2	25.27/0.1	663.55/2.3	27,754.99/97.7	28,418.54/100
Coffin	155.7	61.6/5.8	0	13.52/1.3	1.13/0.1	76.25/7.2	990.49/92.8	1,066.74/100
Rice Canyon	572.0	584.0/5.6	0	382.20/3.7	24.62/0.2	990.82/9.5	9,358.35/90.5	10,349.17/100
Johnston-Chappius	481.6	216.8/3.2	0	436.80/6.5	11.02/0.2	664.62/9.9	6,096.49/90.1	6,761.11/100
Shaffer Mountain	1,290.4	1,158.4/4.6	0	751.92/3.0	80.35/0.3	1,990.67/7.9	23,292.79/92.1	25,283.46/100
TOTALS	18,606.1	18,629.5/5.1	180.00/<0.1	9,029.80/2.5	655.53/0.2	28,494.83/7.8	337,829.91/92.2	366,324.74/100

1/ See APPENDIX A for description of forage allocation procedures.
2/ Cattle + Wild Horses + Deer + Antelope = Total Consumptive.
3/ Total Consumptive + Nonconsumptive = Total.

TABLE 2-12

Existing Range Developments[1/]
Alternative D - No Action

Allotment	Cattleguards (Each)	Tree Plantation (Acres)	Windmills (Each)	Reservoirs (Each)	Spring Developments (Each)	Brush Spray (Acres)	Seeding (Acres)
Walton							
Said Valley							
Buffham-Metcalf	1		1	1			
Dry Valley							
New Bailey Creek	1		1	10			1,950
Williams				6	1	2,000	
New Ravendale	1		1	21	1	15,200	200
North Horse Lake				8			
Slate Creek	2			13			
Bucks Bay	1	960		7		2,300	150
Hansen				1			
Shumway				5	6		
Clark							
Snowstorm			1	9	3		
Erick							
Wood				2	2	2,500	1,600
Cottonwood				2	1		400
Stone							
Walsh Mountain				5			
Barron				4			
South Horse Lake				23	5		
Humphrey 3C							
Tablelands			4	5			
Coffin				2			
Rice Canyon	2			7			
Johnston-Chappuis				7	2	60	160
Shaffer Mountain	1			13			
TOTALS	9	960	8	151	21	22,060	4,460

1/ Existing range developments also include approximately 220 miles of fence in the planning unit.

TABLE 2-13

Vegetation Production Allocation[1/]
Alternative E - No Grazing

ALLOTMENT	CATTLE[2/]	WILD HORSES[2/] (1000 lbs./%)	DEER[2/] (1000 lbs./%)	PRONGHORN[2/] (1000 lbs./%)	TOTAL CONSUMPTIVE[2/3/] (1000 lbs./%)	NON-CONSUMPTIVE[3/] (1000 lbs./%)	TOTAL[3/] (1000 lbs./%)
Walton	0	0	30.16/4.7	3.02/0.5	33.18/94.8	600.77/94.8	633.95/100
Said Valley	0	0	48.88/24.5	4.54/0.2	53.42/2.7	1,937.77/97.3	1,991.19/100
Buffam-Metcalf	0	0	52.00/1.3	11.34/0.3	63.34/1.6	4,086.41/98.4	4,149.75/100
Dry Valley	0	0	14.56/3.3	0.76/0.2	15.32/3.4	428.90/96.6	444.22/100
New Bailey Creek	0	0	771.68/3.0	34.02/0.1	805.70/3.1	24,752.89/96.9	25,558.59/100
Williams	0	0	98.80/2.6	6.05/0.1	104.85/2.7	3,728.61/97.3	3,833.46/100
New Ravendale	0	180.00/0.4	1,463.28/3.4	130.25/0.3	1,773.53/4.1	41,072.21/95.9	42,845.74/100
North Horse Lake	0	0	1,357.20/3.9	71.06/0.2	1,428.26/4.1	33,358.14/95.9	34,786.40/100
Slate Creek	0	0	1,461.20/4.2	88.45/0.2	1,549.65/4.4	33,891.55/95.6	35,441.20/100
Bucks Bay	0	0	336.96/4.5	8.32/0.1	345.28/4.6	7,104.59/95.4	7,449.87/100
Hansen	0	0	111.28/5.7	7.56/0.4	118.84/6.1	1,819.48/93.9	1,938.32/100
Shumway	0	0	246.48/2.3	34.34/0.3	280.82/2.6	10,406.32/97.4	10,687.14/100
Clark	0	0	7.28/1.1	1.30/0.2	8.58/1.3	662.49/98.7	671.07/100
Snowstorm	0	0	2,934.36/5.7	197.64/0.4	3,132.00/6.1	48,534.51/93.9	51,666.51/100
Erick	0	0	61.36/2.7	7.13/0.3	68.49/3.0	2,188.93/97.0	2,257.42/100
Wood	0	0	123.76/3.1	4.54/0.1	128.30/3.2	3,846.68/96.8	3,974.98/100
Cottonwood	0	0	116.48/4.1	9.45/0.3	125.93/4.4	2,722.42/95.6	2,848.35/100
Stone	0	0	34.32/5.6	3.02/0.5	37.34/6.1	579.24/93.9	616.58/100
Walsh Mountain	0	0	166.92/3.9	8.32/0.2	175.24/4.1	4,110.04/95.9	4,285.28/100
Barron	0	0	83.20/2.1	4.91/0.1	88.11/2.2	3,894.78/97.8	3,982.89/100
South Horse Lake	0	0	2,776.80/5.8	151.63/0.3	2,928.43/6.1	45,211.91/93.9	48,140.34/100
Humphrey 3C	0	0	209.04/3.3	14.26/0.2	223.30/3.5	6,019.18/96.5	6,242.48/100
Tablelands	0	0	113.88/0.4	39.53/0.1	153.41/0.5	28,265.13/99.5	28,418.54/100
Coffin	0	0	22.88/2.1	1.89/0.2	24.77/2.3	1,041.97/97.7	1,066.74/100
Rice Canyon	0	0	709.80/6.8	38.23/0.4	748.03/7.2	9,601.14/92.8	10,349.17/100
Johnston-Chappuis	0	0	460.20/6.8	16.85/0.2	477.05/7.0	6,284.06/93.0	6,761.11/100
Shaffer Mountain	0	0	1,492.92/5.9	125.71/0.5	1,618.63/6.4	23,664.83/93.6	25,283.46/100
TOTALS	0	180.00/<0.1	15,305.68/4.2	1,024.12/0.3	16,509.80/4.5	349,814.95/95.5	366,324.75/100

1/ See APPENDIX A for description of forage allocation procedures.
2/ Cattle + Wild Horses + Deer + Antelope = Total Consumptive.
3/ Total Consumptive + Nonconsumptive = Total.

1. Site specific endangered species inventories will be completed before any project is implemented. Endangered species Act, Section 7 consultations will be conducted, if deemed necessary.

2. Land treatment areas and seedings will be rested until seedlings are sufficiently established to resist pull-up from grazing.

3. Before construction of range developments and vegetation manipulations, cultural resources will be inventoried and evaluated, and attempts to avoid adverse effects will be made. Where this is not possible, consultation will be made with the State Historic Preservation Officer (S.H.P.O.) and the Advisory Council on Historic Preservation to develop acceptable mitigative strategies in accordance with the Programmatic Memorandum of Agreement (dated January 14, 1980) between the Bureau and the Advisory Council. In addition, the views of responsible spokesmen of the local Native American community will be solicited. Conflicts will be resolved in accordance with 36 CFR 800 and in accordance with the Memorandum of Agreement signed by the California Native American Heritage Commission, the California S.H.P.O. and the BLM.

4. Construction of fences in wildlife use areas will meet BLM specifications to permit the movement of identified wildlife.

5. Livestock watering developments will be available and safe for wildlife and wild horse needs, as identified.

6. Spring developments generally will be fenced to prevent trampling of the immediate area.

7. All disturbed areas will be reseeded with native and/or introduced species to provide ground cover.

8. New range developments and maintenance of existing developments within Wilderness Study Areas will meet the Bureau's Interim Management Policy.

9. All water projects or projects which could influence the beneficial use of water will conform to BLM Best Management Practices Guidelines.

10. Visual impacts on an area will not exceed limits imposed for the area's designated VRM class. A contrast rating will be conducted on the ground for each type of range improvement project to meet Bureau Manual 8431.11 requirements. The contrast rating will also suggest mitigation to further lessen the impacts.

Range Development Descriptions

Water troughs:

- 18 ft. circular ring with concrete base, or 3 ft. X 12 ft. metal trough.
- All troughs have wildlife escape ramps.
- Disturbance = 0.2 acres per trough.

Windmills:

- Drill and case.
- Place pump facilities.
- Place storage tank (optional).
- Disturbance = 0.2 acres per windmill.

Fences:

- Install per specifications (i.e., antelope type fence).
- Disturbance = 1 acre per mile.

Land Treatments:

- Brush control by one or more of the following methods:
  - Applying 2,4-D from aircraft
  - Burning
  - Dragging anchor chain between tractors
  - Plowing with multiple disk plow
  - Beating brush with rotary brush beater
- Seeding by rangeland drill with desirable forage species after brush control.
- Fuel breaks by removing brush in irregular patterns with controlled fire.
- Juniper reduction by chaining, controlled burning, or cutting.
- Noxious weed control by any one or combination of:
  - Herbicide application
  - Burning
  - Plowing
  - Seeding (drill or broadcast)
  - Interseeding

All land treatments will consider wildlife habitat needs (i.e., leave islands of existing vegetation, create interspersion, and provide diversity of habitat).

Springs:

- Excavate spring source.
- Install 3' x 3' metal headbox.
- Pipe water to trough.
- Leave water at source for wildlife.
- Pipe overflow into original drainage.
- Fence meadow complex.
- Disturbance = 0.5 acres each.

Reservoirs:

- Excavate and place dike.
- Provide spillway.
- Size = 1 to 2 acres.
- Average capacity = 8 acre feet.

Cattleguards:

- Located where fences cross roads.
- Generally 8 feet wide and 12 to 24 feet long.

Monitoring Program

Implementation of the Proposed Action would require establishing a monitoring system to ensure that grazing management actions and practices achieve management objectives.

Monitoring intensity would be variable depending upon allotment management category, special resource needs, and funding constraints. Generally, monitoring intensity would be moderate to high on Improvement allotments, low to moderate on Maintenance allotments, and low on Custodial allotments.

Monitoring components would be as follows:

Trend

Trend is the direction of change in range condition as a result of environmental factors, primarily climate and grazing. BLM Manual 4430.56 would be used as a general guide in developing trend-monitoring procedures. Plant frequency and ground cover would be sampled to evaluate vegetation and soil trend. Other parameters, such as canopy, seedlings, or shrub characteristics would be considered on unique areas (i.e., stringer meadows, riparian zones, aspen stands, and bitterbrush and mahogany thickets).

Utilization

During and after grazing of each pasture, forage utilization would be measured by the key forage plant method described in BLM Manual 4430.47. These studies would aid in determining whether stocking levels are providing proper use and what adjustments, if any, would be needed. These studies would also provide a schedule for seasonal pasture movement.

Actual Use

Livestock operators would file actual use reports showing how many and how long cattle grazed in a particular pasture. These reports would provide accurate information on annual stocking rates.

Precipitation

Rain gauges would provide measurements of precipitation to help interpret vegetation production variations resulting from climatic changes.

Water Quality and Quantity

Water quality and quantity would be monitored in conjunction with the Water Rights Program and the 208 Water Quality Program. Areas with water quality problems would be monitored at least four times a year to reflect seasonally significant events. Qualitative trend assessments of all perennial waters would be made on a biannual basis. Methods for assessment would be in accordance with the National Handbook of Recommended Methods for Water Data Acquisition (U. S. Department of the Interior, 1980).

Soil Movement

Soil movement would be assessed in conjunction with trend/utilization studies and would use the Modified Universal Soil Loss Equation (Wischmeier and Smith, 1978). Changes in gully development along transects would be documented. Clay mineral analysis of sediment would be used to monitor changes in sediment/erosion source.

Threatened and Endangered Plants

Lomatium ravenii population would be monitored during the first few years of action implementation to ensure that there are no adverse impacts upon the plant's populations.

Cultural Resources

To assess the nature and intensity of impacts resulting from the various grazing systems proposed, all cultural resources identified in consultation with the State Historic Preservation Officer (S.H.P.O.) as having National Register potential would be monitored at the end of each active grazing season. A log and photo trend data would be maintained for each. Accumulation of adverse impacts could require exclusion of that property from grazing. The results of monitoring, and any proposals for subsequent action, would be submitted for review to the State Historic Preservation Officer.

To partially compensate for the continuation of adverse impacts on so-far unrecorded cultural resources, an ongoing inventory program would be established to increase knowledge of the planning unit by a factor of 1 percent of the area per year. All sites recorded in this effort would be evaluated for significance, and the impacts of grazing on them assessed. All sites judged eligible for inclusion on the National Register would be incorporated in the monitoring program described above.

Wild Horses

Population numbers and location would be monitored biennially to assess the effects of removals, fencing, and other range improvements on the herd. A similar monitoring program is explained in the Cal-Neva EIS (U.S. Department of the Interior, 1981a) for the Cal-Neva Planning Unit which has the highest concentration of wild horses and burros in the Susanville District (1980 inventory: 1,500 horses and 180 burros).

Wetlands

Meadows would be monitored to determine impacts from livestock grazing activities. To ensure compliance with Executive Order No. 11990, vegetation condition, water table, and erosion would be assessed.

Grazing Administration

Term permits would be issued to each operator specifying the season of use and number and kind of livestock. Use on the allotments would be supervised throughout the grazing year, with priority given to Improvement Allotments.

Operators who want to change the grazing outlined in their permit would need prior BLM approval. Trespass actions would be initiated for any allotment grazed outside the limits described in the permit. The trespass would be eliminated and payment retrieved from those responsible for damage and the consumption of forage.

COMPARISON OF ALTERNATIVES

TABLE 2-14 summarizes the specific components of each alternative. TABLE 2-15 summarizes and compares the potential impacts of each alternative on the different resources affected. Chapter 4 more fully describes those potential impacts.

TABLE 2-14

Summary of Alternatives

	Proposed Action Alternative A	Decreased Livestock Use Alternative B	Increased Livestock Use Alternative C	No Action Alternative D	No Grazing Alternative E
STOCKING LEVELS					
Gattle (AUMs)	27,450	15,278	30,874	23,257	0
Sheep	0	0	0	0	0
VEGETATION ALLOGATION (1,000 lbs./ Percent)					
To Livestock	21,940.00/6.0	20,336.00/5.6	24,568.80/6.7	18,629.50/5.1	0
To Wildlife (Deer & Pronghorn)	16,329.80/4.4	16,329.80/4.4	9,685.33/2.6	9,685.33/0.2	16,329.80/4.5
To Wild Horses	180.00/<0.1	180.00/<0.1	180.00/<0.1	180.00/<0.1	180.00/<0.1
To Nonconsumptive Uses	327,874.96/89.5	329,478.96/89.9	331,810.60/90.6	337,829.91/92.2	349,814.85/95.5
Total	366,324.75/100	366,324.75/100	336,324.75/100	336,324.75/100	366,324.75/100
GRAZING MANAGEMENT					
Number of Allotments	26	26	26	27	0
Management Category:					
Improvement	10	10	10	-	-
Maintenance	9	9	9	-	-
Custodial	7	7	7	-	-
Type (AMP/Non-AMP)	11/15	12/14	20/6	3/24	-
RANGE DEVELOPMENTS					
New Projects:					
Fence (Miles)	87	84.5	90	0	0
Gattleguards (Number)	6	6	6	0	0
Windmills (Number)	3	0	3	0	0
Reservoirs (Number)	60	31	61	0	0
Spring Developments (Number)	15	0	15	0	0
Brush Control (Acres)	23,000	0	42,300	0	0
Fuel Break (Acres)	8,900	0	0	0	0
Seedings (Acres)	3,000	3,000	12,700	0	0
Noxious Weed Gontrol (Acres)	38,300	38,300	38,300	0	0
Juniper Reduction (Acres)	3,000	0	12,500	0	0
Gost of Implementation	$987,800	$665,400	$1,259,300	0	0
WILD HORSES (Number)	15	15	15	15	15
LIVESTOCK GONFLICT AREAS					
Willow Greek	Fence 7 linear miles with water gaps for livestock.	Fence 7 linear miles & exclude livestock use.	No protection.	No protection.	No livestock grazing.
Eagle Lake	Fence 4 miles of shoreline.	Fence & exclude livestock from entire public shoreline.	No protection.	No protection.	No livestock grazing.
Rocky Point Campground	Prohibit livestock except by special permit.	Exclude livestock.	Grazing allowed between 05/01-09/30.	Grazing allowed between 05/01-09/30.	No livestock grazing.
Snowstorm Wetland	Fence & exclude livestock.	Fence & exclude livestock.	No protection.	No protection.	No livestock grazing.

TABLE 2-15

Grazing Impacts Summary

ELEMENT EVALUATED	UNITS	EXISTING SITUATION	PROPOSED ACTION ALTERNATIVE A	DECREASED LIVESTOCK USE ALTERNATIVE B	INCREASED LIVESTOCK USE ALTERNATIVE C	NO ACTION ALTERNATIVE D	NO GRAZING ALTERNATIVE E
ISSUE 1 - WILDLIFE - LIVESTOCK CONFLICTS							
Mule Deer Habitat			Slow overall improvement	Moderate overall improvement	General decline	General decline	Initial enhancement, then gradual decline.
Mule Deer Population	Numbers	6,600	Increase toward 11,100	Increase toward 11,100	Decline	Gradual decline	Increase toward 11,100, then slow decline
Pronghorn Habitat			Slow overall Improvement	Moderate overall improvement	General Decline	Maintenance or slight decline	Enhancement
Pronghorn Population	Numbers	800	Increase toward 1,250	Increase toward 1,250	Slight decrease	Slight increase	Increase toward 1,250
Sage Grouse Habitat			Slight improvement	Moderate improvement	Decline	Slow decline	Significant improvement
Sage Grouse Population	Numbers		Slight increase	Moderate increase	Moderate decrease	Slight decrease	Significant increase
Other Game Bird Population	Numbers						
Chukar			Slight increase	Slight increase	Slight increase	Stable	Slight decrease
Quail			Slight increase	Slight increase	Slight decrease	Slight decrease	Slight increase
Mourning Dove			Increase	Increase	Below potential	Below potential	Slight increase
Waterfowl			Slight increase	Slight increase	Below potential	Below potential	Slight increase
Fisheries			Improvement	Improvement	Decline	Below potential	Improvement
Special Habitat Types (riparian, aspen, semi-wet meadows, bitterbrush and mahogany areas)			Slight overall enhancement	Moderate overall enhancement	Slight to moderate decline	Continued degradation	Significant improvement of willow riparian and semi-wet meadows. Slight improvement in bitterbrush and mahogany.

TABLE 2-15 (continued)

Grazing Impacts Summary

ELEMENT EVALUATED	UNITS	EXISTING SITUATION	PROPOSED ACTION ALTERNATIVE A	DECREASED LIVESTOCK USE ALTERNATIVE B	INCREASED LIVESTOCK USE ALTERNATIVE C	NO ACTION ALTERNATIVE D	NO GRAZING ALTERNATIVE E
ISSUE 2 - SOCIAL AND ECONOMIC CONDITIONS							
Change in Cattle Sales							
Short Term	Thousands of Dollars	326	+59	-112	+107	No change	-326
Long Term (max)			+72	-55	+135	No change	-326
Recreation - Based Employment	Additional Seasonal jobs		up to 6	up to 6	No change	No change	up to 6
Number of Operators Substantially Affected (Threshold: 10% of total annual forage supply lost or gained)							
Short Term	Numbers	22	2 gain	6 lost	5 gain	No change	14 lost
Long Term	Numbers		1 lost, 1 gain	5 lost	4 gain, 1 lost	4 lost, 1 gain	14 lost
ISSUE 3 - MANAGEMENT OF EAGLE LAKE BASIN							
Livestock-Shoreline User Conflicts			Significantly Reduced	Eliminated	Continued	Continued	Eliminated
Grazing of Shoreline and Aquatic Vegetation			Reduced	Eliminated	Continued	Continued	Eliminated
Rocky Point-Livestock Recreation Conflicts			Continued use in October	Eliminated	Continued	Continued	Eliminated
Cultural Resource Site Deterioration			Reduced	Reduced	Further deterioration	Continued deterioration	Eliminated
Scenic Quality			Improved	Improved	Conspicuous visual impacts	Maintained	Improved
VRM Objectives			Met	Met	Not met	Met	Met
Littoral Muck Disturbance, Pathogen Content, Sediment, And Nutrient Delivery			Insignificant decrease	Insignificant decrease	Increase	No change	Decrease
Range Mangement Portion - Best Management Practice for Water Quality			Satisfied	Satisfied	Not Satisfied	Not Satisfied	Satisfied

TABLE 2-15 (continued)

Grazing Impacts Summary

ELEMENT EVALUATED	UNITS	EXISTING SITUATION	PROPOSED ACTION ALTERNATIVE A	DECREASED LIVESTOCK USE ALTERNATIVE B	INCREASED LIVESTOCK USE ALTERNATIVE C	NO ACTION ALTERNATIVE D	NO GRAZING ALTERNATIVE E
ISSUE 4 - PROTECTION OF WILLOW CREEK VALUES							
Soil Compaction, Streambank Deterioration and Soil Cover			Significant improvement	Significant improvement	Significant degradation	Further degradation	Significant improvement
Water Quality - Best Management Practices			Satisfied	Satisfied	Not Satisfied	Not Satisfied	Satisfied
Fishery Potential			Significant improvement	Significant improvement	Further degradation	Further degradation	Significant improvement
Cultural Resource Site Deterioration			Reduced	Reduced	Accelerated	Continued	Reduced
Fishing, Hiking, and Sightseeing Quality			Improved	Improved	Reduced	Slightly reduced	Improved
Scenic Quality			Enhanced	Enhanced	Lowered	Slightly lowered	Enhanced
ISSUE 5 - RANGE CONDITION AND PRODUCTION							
Condition:							
Sparse Canopy Class	Acres/% change	18,613	13,925/-25	17,141/-8	10,326/-45	16,821/-9	16,782/-10
Medium Canopy Class	Acres/% change	1,115	1,333/+20	2,244/+101	1,301/+17	2,534/+128	2,497/+124
Dense Canopy Class	Acres/% change	5,246	5,404/+3	5,587/+6	5,284/+1	5,619/+7	5,642/+8
Poor	Acres/% change	60,140	53,503/-11	56,858/-5	51,156/-15	62,259/+4	58,429/-3
Fair	Acres/% change	161,194	161,003/-<1	158,447/-2	159,143/-1	159,072/-1	131,702/-18
Excellent and Good	Acres/% change	26,680	37,820/+42	32,711/+23	45,778/+74	26,680/0	53,936/+117
Production:	AUMS/% change	22,522	28,396/+22	27,292/+17	32,873/+46	23,242/+3	27,188/+17

TABLE 2-15 (continued)

Grazing Impacts Summary

ELEMENT EVALUATED	UNITS	EXISTING SITUATION	PROPOSED ACTION ALTERNATIVE A	DECREASED LIVESTOCK USE ALTERNATIVE B	INCREASED LIVESTOCK USE ALTERNATIVE C	NO ACTION ALTERNATIVE D	NO GRAZING ALTERNATIVE E
NON ISSUE RELATED IMPACTS							
Soils							
Compaction							
Area Wide			Reduced	Reduced	Slightly reduced	Slight increase	Reduced
Concentration Areas			Greatly reduced	Slightly reduced	Increased	Slight increase	Greatly reduced
Infiltration							
Area Wide			Increased	Increased	Slight increase	Reduced	Increased
Concentration			Increased	No change	No change	No change	Increased
Cover							
Area Wide			Increased	Slight increase	Increased	No change	No change
Concentration			Increased	Increased	Decreased	No change	Increased
Meets Soil Objectives			Yes	Yes	Yes	No	Marginally-yes
Water Resources							
Surface Quality - Meets Objective							
Sediment			Yes	Yes	No	No	Yes
Temperature			Yes	Yes	No	No	May
Pathogens			Yes	Yes	No	May Not	Yes
Dissolved Oxygen			Yes	Yes	May Not	Yes	Yes
Water Supply - Meets Objective			Yes	Yes	Yes	Yes	Yes
Wetlands - Meets Objective			Yes	Yes	Marginally-yes	No	No
T & E Plants							
(*Lomatium ravenii*)			No impacts with mitigation	No impacts with mitigation	No impacts with mitigation	No impacts	Possible slight long term decrease
Livestock Performance			Improvement	Improvement	Improvement	No Change	N/A

TABLE 2-15 (continued)

Grazing Impacts Summary

ELEMENT EVALUATED	UNITS	EXISTING SITUATION	PROPOSED ACTION ALTERNATIVE A	DECREASED LIVESTOCK USE ALTERNATIVE B	INCREASED LIVESTOCK USE ALTERNATIVE C	NO ACTION ALTERNATIVE D	NO GRAZING ALTERNATIVE E
Wild Horses	Numbers	15	15	15	15	15	15
Recreation							
Hunting Opportunities							
Deer and Antelope	Hunter Days	11,549 and 125, respectively	Increase up to 68% for deer and 56% for pronghorn.	Gradual increase up to 68% for deer and 56% for pronghorn	Slight decrease	Slight decrease for deer and slight increase for pronghorn	Initially up to 68% for deer and 56% for pronghorn. Long term reduction in deer hunting.
Upland Game Birds	Hunter Days		Increase	Slight Increase	Slight decrease for sage grouse and quail. Slight increase for chukar.	Slight decrease for sage grouse and quail. No change for chukar.	Significant increase for sage grouse. Slight increase for quail and dove. Slight decrease for chukar.
Off Highway Vehicle Use Opportunities			Unchanged	Unchanged	Unchanged	Unchanged	Unchanged
Visual Resources							
Meets Class Objectives			Yes	Yes	Overall-Yes	Yes	Yes
Wilderness							
Suitability - Preserved			Yes	Yes	No	Yes	Yes
Meets Non Impairment Criteria			Yes	Yes	No	Yes	Yes
Cultural Resources							
Site Deterioration due to:							
Trampling			Continued	Reduced	Accelerated	Continued	Eliminated
Erosion			Reduced	Reduced	Accelerated	Continued	Greatly reduced

Chapter 3

Affected Environment

Chapter 3

AFFECTED ENVIRONMENT

INTRODUCTION

This chapter provides:

- A description of the environment as it presently exists to serve as a baseline for comparison with impacts projected in Chapter 4 for the Proposed Action and Alternatives.
- A description of only those components of the environment likely to be affected by implementation of the Proposed Action or Alternatives.
- No consideration of those components not likely to be significantly impacted, such as air quality and geology.

ENVIRONMENTAL COMPONENTS

Soil

The Soil Conservation Service has recently completed a modern soil survey of public lands in the Willow Creek Planning Unit (U. S. Department of Agriculture, 1980). This interim report should be referred to for specific soil interpretations. From the interpretations given in the report, the soils within those areas proposed for projects (i.e., reservoirs, roads, etc.) are suitable for those purposes.

Meaningful soil erosion data is not available at this time but will be available when the complete soil survey report is published and the monitoring program (page 2-34) is implemented. Accelerated erosion has been observed along stream channels, meadows, and in the Rice Canyon watershed. The impact of accelerated erosion along stream channels tends to affect the stream channel hydraulics and water quality of the stream by increasing the sediment load and flattening the stream cross-section. Erosion in meadows results in deep gullies which, in turn, lower the water table and desiccate the soil. Erosion in Rice Canyon probably affects the species composition and productivity of the range. The eroding soils in Rice Canyon are all mollisols with a loamy to fine loamy surface texture (Stephens, 1981). Mollisols are soils which have a thick (> 25 cm) organic surface layer which are capable of supporting productive stands of grass (U. S. Department of Agriculture, 1975).

Water Resources

Surface Water

Stream flow fluctuates greatly due to irregularity in quantity and duration of precipitation. Streams flow into closed basins where water is lost by percolation or evapotranspiration. Willow Creek, the area's most important stream, is used for irrigation and cold water fishery. Its flow of 15,000 to 20,000 acre feet per year originates from springs. Other perennial streams include Snowstorm Creek, Pine Creek, and Secret Creek.

Eagle Lake, approximately 28,000 surface acres, is fed primarily by subsurface springs and has no surface outflow. See Eagle Lake Tunnel Hazard Reduction and Seal EAR (U. S. Department of the Interior, 1974) and the Eagle Lake Basin Plan (Vail and Associates, 1979) for more detailed information, including water quality.

Numerous water impoundments (earthen dams and spring developments) are found within the planning unit. Many of these impoundments dry up during summer. Large reservoirs provide important wildlife habitat and Biscar Reservoir supports warm water game fish.

Water quality is generally suitable for existing or proposed uses (U. S. Department of the Interior, 1979). However, Willow Creek is marginal for proposed uses due to:

- Bacteria levels which on occasion exceed State and Federal health standards for contact recreation.
- High pH, temperature, and nitrogen which are marginal for fish production.

Eagle Lake water quality adjacent to public shoreline occasionally exceeds state standards for bacteria. In February, 1981, the Eagle Lake Basin Interagency Board of Directors requested that the Lahontan Regional Water Quality Control Board (State of California Agency) develop a program for the monitoring and protection of Eagle Lake to ensure maintenance and improvement of water quality. The Board suggested consideration of effects of grazing and other basin land uses on water quality. That study is now in progress.

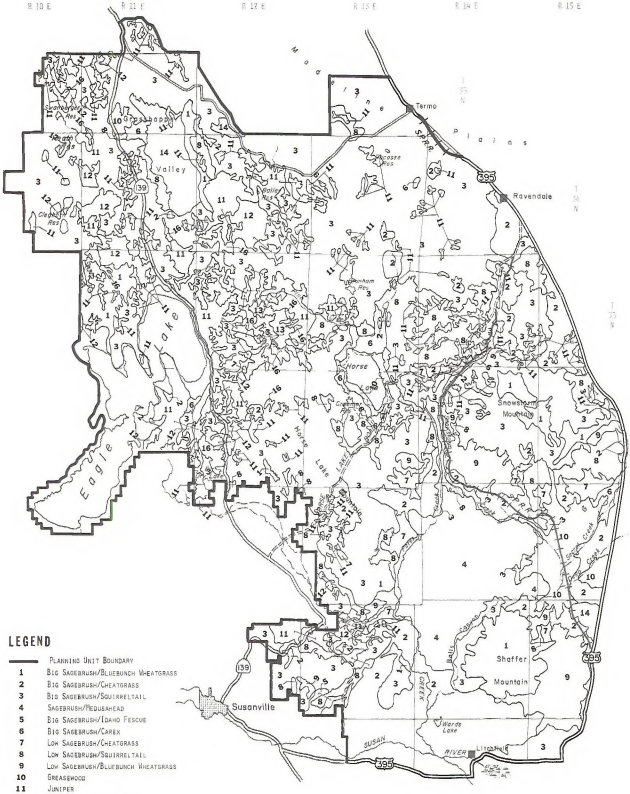
Ground Water

Four significant ground water basins, as well as many small basins and abundant springs, lie entirely or partially within the planning unit. Although it is not possible to quantify water supplies, sufficient quantities are available for traditional uses and developments (springs, wells, etc.). Water quality is suitable for existing and proposed uses.

Vegetation

Vegetation Types

Undisturbed stands of climax (natural potential) vegetation are rare in the planning unit. MAP 3-1 shows the vegetation types within the planning unit. The vegetation types are described in detail in the SCS National Range Handbook Range Site Descriptions (U.S. Department of Agriculture, 1976). As the original sagebrush-bunchgrass ranges were intensively used by livestock, the plant composition changed, with many less palatable, weedy species becoming increasingly prominent at the expense of more palatable species. In addition, woodland canopy, particularly juniper, has increased, limiting grass production and access for grazing. Woodland canopy is classified by crown closure (see Glossary). Sites are not readily grazed by livestock when canopy class exceeds 15 percent (U. S. Department of Agriculture, 1980). Woodland canopy includes juniper, ponderosa pine, jeffrey pine, and mountain mahogany.



LEGEND

▬	Planning Unit Boundary
1	Big Sagebrush/Bluebunch Wheatgrass
2	Big Sagebrush/Cheatgrass
3	Big Sagebrush/Squirreltail
4	Sagebrush/Medusahead
5	Big Sagebrush/Idaho Fescue
6	Big Sagebrush/Carex
7	Low Sagebrush/Cheatgrass
8	Low Sagebrush/Squirreltail
9	Low Sagebrush/Bluebunch Wheatgrass
10	Greasewood
11	Juniper
12	Ponderosa & Jeffrey Pine
13	White Fir
14	Annual Forbs
15	Burn
16	Mt. Mahogany

**WILLOW CREEK
PLANNING UNIT
VEGETATION**

Range Condition

The Willow Creek Planning Unit is primarily in fair range condition (TABLE 3-1 and MAP 3-2). Historic heavy grazing by livestock, especially continuous grazing during the spring and early summer, has been the most important environmental change agent affecting range condition. The present range condition reflects a stabilization in fair condition. See APPENDIX A for a description of methodology for vegetation inventory, forage allocation, and determination of range condition.

Production

Most rangeland is not presently producing its potential quantity and quality of vegetation, although there has been a stabilization of vegetation production in most allotments in the last 20 years (TABLE 3-1).

Rangeland Suitability (TABLE 2-10)

- 270,022 (91%) acres suitable for grazing.
- 20,353 (7%) acres potentially suitable for grazing.
- 6,603 (2%) acres unsuitable for grazing.
- Distribution of water primary limiting factor.

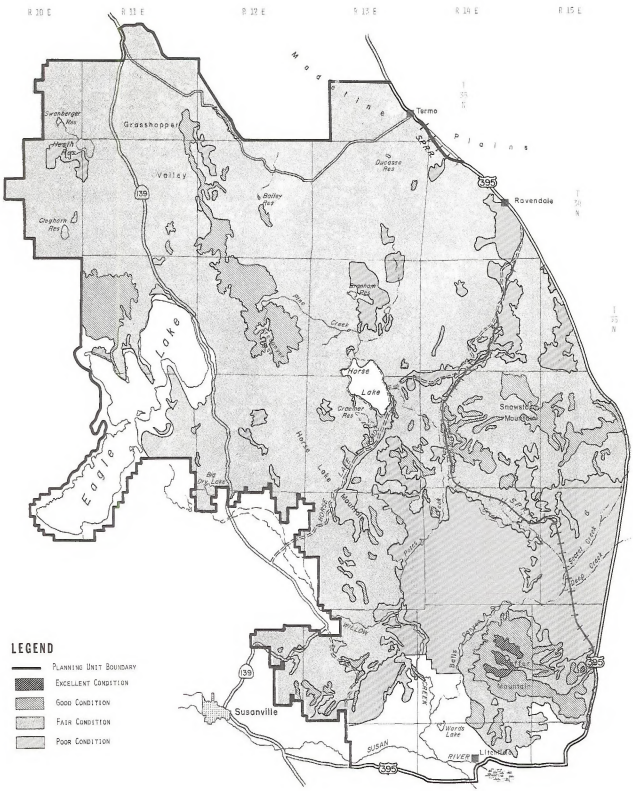
See APPENDIX A for description of methodology for determining range suitability.

Poisonous or Noxious Plants

A wide range of poisonous or noxious plants occurs within the planning unit, but medusahead (Taeniatherum asperum) is the only noxious plant causing a significant problem. Medusahead, which is relatively unpalatable, competes effectively with other more desirable annual grass and perennial grass seedlings, thus greatly reducing the forage production of clayey sites in the Tablelands area (Hilken and Miller, 1980). Over 38,000 acres have been invaded by medusahead since the early 1960s and the infested area continues to expand. Total eradication of this weed would not be possible because of site limitations and expanse of spread. However, the rate of spread could be slowed and portions of the infested range improved by substituting good forage plants for medusahead and spot treating isolated infestations.

Threatened and Endangered Plants

No known Federally listed threatened or endangered plants occur within the Willow Creek Planning Unit (California Native Plant Society, 1980 and 1981). Lomatium ravenii is listed as endangered by the State of California. Known populations occur in the New Ravendale Allotment and the Snowstorm Allotment near Shaffer Well. There has been no noticeable grazing of Lomatium ravenii by livestock under past grazing patterns.



WILLOW CREEK
PLANNING UNIT
RANGE CONDITION

TABLE 3-1

Present Rangeland Condition, Woodland Canopy Class, and Production

ALLOTMENT	RANGELAND CONDITION[1/] (ACRES/PERCENT) Excellent and Good	Fair	Poor	WOODLAND CANOPY CLASS[1/] (ACRES/PERCENT) Dense	Medium	Sparse	BARREN LAND[1/] (Acres/Percent)	TOTAL[1/] (Acres)	PRODUCTION (AUMs)
Walton	0	461/50	0	197/21	0	272/29	0	930	73
Said Valley	164/11	1,208/78	138/9	0	0	0	35/2	1,545	203
Buffam-Metcalf	177/4	2,907/70	802/19	0	0	0	279/7	4,165	274
Dry Valley	9/2	309/68	120/27	0	0	0	15/3	453	53
New Bailey Creek	974/6	12,957/78	386/2	76/1	93/1	686/4	1,397/8	16,569	1,479
Williams	0	2,750/90	1/<1			125/4	182/6	3,058	457
New Ravendale	95/<1	21,748/65	8,377/25	0	0	808/2	2,505/8	33,533	2,835
North Horse Lake	2,191/8	18,815/70	1,319/5	1,641/6	278/1	1,564/6	1,066/4	26,874	2,659
Slate Creek	2,033/8	13,576/51	1,123/4	1,961/7	239/1	6,253/24	1,344/5	26,529	1,826
Bucks Bay	1,224/24	2,489/48	83/2	677/13	0	619/12	62/1	5,154	728
Hansen	11/1	729/58	387/31	0	0	31/2	105/8	1,263	160
Shumway	41/1	5,149/47	1,446/14	0	0	3,243/31	728/7	10,607	862
Clark	0	70/41	81/47	0	0	7/4	14/8	172	25
Snowstorm Mountain	5,986/14	21,145/47	10,863/25	0	0	3/1	5,684/13	43,681	3,785
Erick	158/6	1,649/67	518/21	0	0	0	150/6	2,475	203
Wood	21/1	2,060/94	87/4	0	12/<1	0	9/<1	2,189	232
Cottonwood	0	1,593/94	0	0	0	49/3	50/3	1,692	142
Stone	2/1	524/60	0	0	0	328/36	28/3	882	82
Walsh Mountain	440/9	1,602/33	253/5	125/3	481/10	1,518/32	361/8	4,780	283
Barron	96/2	3,062/70	248/6	78/2	12/1	95/2	718/17	4,309	134
South Horse Lake	3,655/9	29,025/70	4,708/11	165/1	0	1,506/3	2,610/6	41,669	3,166
Humphrey 3-C	5/<1	546/11	4,328/84	0	0	0	217/5	5,096	386
Tablelands	18/1	361/2	14,832/91	0	0	0	1,049/6	16,260	714
Coffin	223/21	197/18	0	0	0	560/53	82/8	1,062	77
Rice Canyon	1,057/9	6,019/56	2,377/22	0	0	492/5	855/8	10,800	685
Johnson-Chappuis	34/<1	2,262/33	3,077/46	326/5	0	454/7	615/9	6,768	271
Shaffer	8,066/33	7,981/33	4,586/19	0	0	0	3,830/15	24,463	1,448
TOTALS	26,680/10	161,194/54	60,140/20	5,246/2	1,115/1	18,613/6	23,990/8	296,978	23,242

1/ Rangeland + Woodland + Barren Land = Total Land

Livestock

Current Profile (TABLE 3-2)

- 27 Allotments (17 individual, 10 in common).
- 22 Operators.
- 5,384 Cattle.
- 0 Sheep.
- No suspended nonuse.
- Use reduced 60% to existing grazing capacity in 1961.

Wild Horses

One herd of 15 horses resides in the New Ravendale Allotment. The population is slightly increasing and adequate forage is currently available to support the herd.

Wildlife

There are approximately 325 wildlife species known to occur in the planning unit. The following discussion addresses the species primarily affected by livestock grazing:

Mule Deer

MAP 3-3 shows the distribution of mule deer range in the planning unit. APPENDIX B describes the methodology for determining mule deer habitat condition.

TABLE 3-3
Mule Deer Habitat Condition

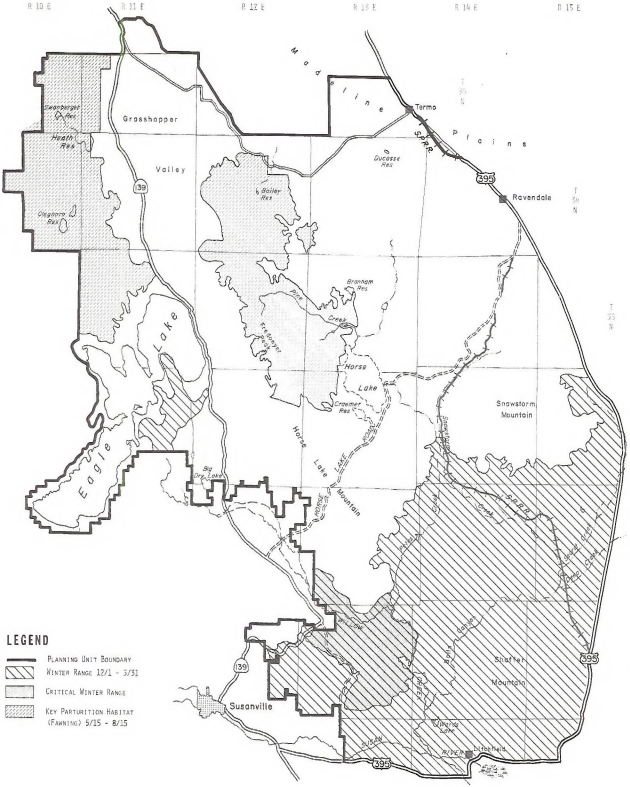
	POOR		FAIR		GOOD		TOTAL	
	ACRES	%	ACRES	%	ACRES	%	ACRES	%
Winter	13,629	15	39,335	43	37,532	42	90,496	100
Spring/Summer	32,933	11	189,251	64	74,287	25	296,471	100
Parturition	8,583	11	59,573	73	13,261	16	81,417	100
Fall	32,933	11	164,027	55	99,511	34	296,471	100

There are approximately 6,600 resident deer with 2,000 additional animals in winter. Over the last 5 years, the population has decreased by 2,500 animals (36%). Although the cause of this decline is undetermined, it is thought to be related to drought conditions and the subsequent reduction in annual vegetation. Fall precipitation and the accompanying green-up can be especially beneficial to deer as they prepare for winter.

TABLE 3-2

Existing Livestock Grazing Use

Allotment	Number of Operators	Ownership (Acres) Federal	State	Private	Authorized Use (AUMs)	Season of Use	Class of Livestock
Walton	1	930	0	5,320	94	06/16-09/31	Cattle
Said Valley	1	1,545	40	2,313	232	04/16-10/31	Cattle
Buffam-Metcalf	1	4,165	0	760	246	05/15-10/31	Cattle
Dry Valley	1	453	100	573	24	04/16-10/31	Cattle
New Bailey Creek	3	16,569	1,520	13,840	2,033	04/16-09/30	Cattle
Williams	1	3,058	0	1,360	519	05/16-10/31	Cattle
New Ravendale	2	33,533	2,640	5,480	1,944	04/01-10/31	Cattle
North Horse Lake	2	26,874	1,460	5,000	1,968	04/01-10/31	Cattle
Slate Creek	3	26,529	3,840	19,652	2,066	04/16-10/31	Cattle
Bucks Bay	1	5,154	0	1,420	840	05/01-09/30	Cattle
Hansen Individual	1	1,263	200	2,080	129	04/16-09/15	Cattle
Shumway	1	10,607	640	1,020	1,046	04/16-10/31	Cattle
Clark	1	172	0	245	12	05/16-09/15	Cattle
Snowstorm	3	43,681	2,600	8,160	3,605	04/16-10/31	Cattle
Erick	1	2,475	0	880	230	04/16-09/15	Cattle
Wood Individual	1	2,189	0	1,017	253	05/01-09/30	Cattle
Cottonwood	1	1,692	0	760	33	05/01-08/09	Cattle
Stone Individual	1	882	0	1,526	50	04/01-12/31	Cattle
Walsh Mountain	1	4,780	680	16,240	291	04/16-09/15	Cattle
Barron	1	4,309	0	275	122	04/01-09/30	Cattle
South Horse Lake	6	41,669	1,920	4,160	2,759	04/01-08/31	Cattle
Humphrey 3-C	3	5,096	0	428	309	04/01-06/30	Cattle
Tableland	4	16,260	1,260	1,301	1,328	04/16-10/15	Cattle
Coffin Individual	1	1,062	0	1,099	194	05/01-10/31	Cattle
Rice Canyon	5	10,800	360	2,320	715	04/01-08/31	Cattle
Johnston-Chappuis	2	6,768	0	769	602	04/16-06/30	Cattle
Shaffer Mountain	2	24,463	1,940	3,656	1,613	04/16-08/31	Cattle
TOTALS	22	296,978	19,200	101,654	23,257		



WILLOW CREEK PLANNING UNIT

MULE DEER HABITAT

Deer populations are estimated using pre and post season composition counts and a change in ratio formula. The California Department of Fish and Game has set the objective population goal at 11,100 animals (Pyshora, 1981). This number is comparable to the population numbers existing during the mid 1960s. However, the California Department of Fish and Game is currently writing a management plan for the East Lassen deer herd and the objective numbers resulting from the plan could possibly change downward.

Parturition (fawning) occurs throughout the planning unit wherever suitable habitat occurs.

Pronghorn

MAP 3-4 shows the distribution of pronghorn range in the planning unit. APPENDIX B describes the methodology for determining pronghorn habitat condition.

TABLE 3-4
Pronghorn Habitat Condition

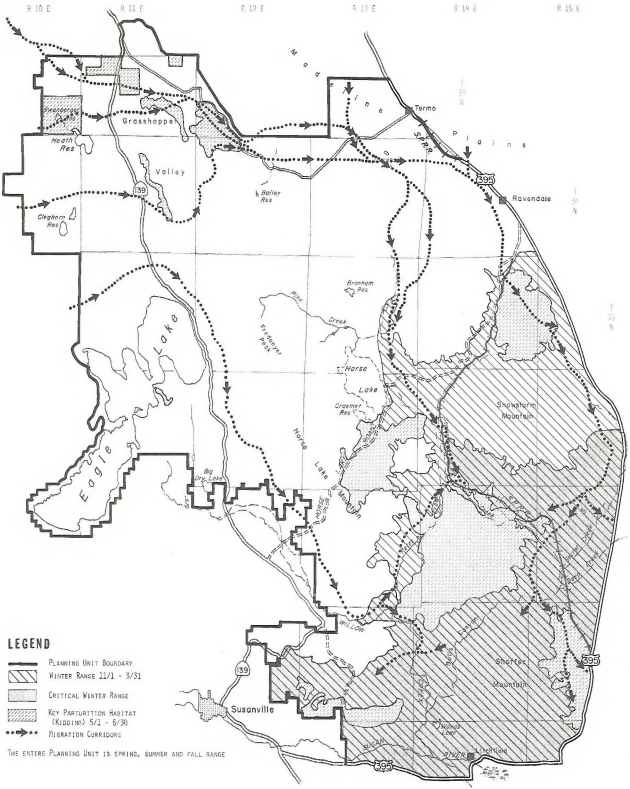
	POOR		FAIR		GOOD		TOTAL	
	ACRES	%	ACRES	%	ACRES	%	ACRES	%
Winter	18,376	18	71,746	69	13,536	13	103,658	100
Spring	94,011	33	172,315	61	15,666	6	281,992	100
Parturition	7,469	20	28,095	75	1,860	5	37,424	100
Summer	72,378	34	126,708	60	11,386	6	210,472	100
Fall	101,141	36	165,263	59	15,588	5	281,992	100

There are approximately 800 resident pronghorn in the planning unit. Because of their migratory nature, this number can double during the winter. The population has increased by 40 percent over past 5 years but is now tending to stabilize.

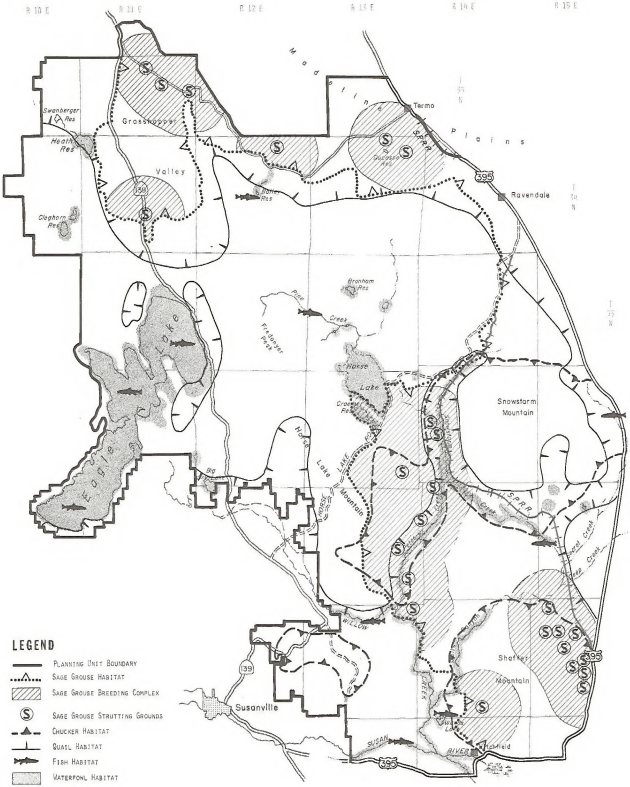
The California Department of Fish and Game has an objective to restore and maintain the Lassen subunit of the California pronghorn population at 2,500 wintering animals (California Department of Fish and Game, 1981). Approximately half of this population or 1,250 wintering animals would inhabit the Willow Creek Planning Unit. This population increase would be the result of relocating animals from other subunits and experimental predator control.

Sage Grouse

MAP 3-5 shows the distribution of sage grouse habitat in the planning unit. Population estimates for sage grouse are not available at this time. However, sex and age structure, determined by sampling the hunter take, indicate that the population is stable enough to continue the hunting season. The meadow areas that are important for brood rearing are generally stable, although a few are slightly declining in condition.



WILLOW CREEK
PLANNING UNIT
PRONGHORN ANTELOPE HABITAT



WILLOW CREEK PLANNING UNIT

GAMEBIRD AND FISH HABITAT

Other Game Birds

Chukar, quail, dove, and waterfowl habitat locations are shown on MAP 3-5.

All game bird populations fluctuate, generally in response to the weather conditions during the nesting and brood rearing season. The planning unit supports:

- Moderate chukar base populations, which are currently expanding their range. They are found throughout the planning unit, and are associated with poor and fair range condition and rugged rocky terrain.
- Moderate California quail base populations, generally associated with willow-riparian areas.
- Moderate to low Mourning dove populations, due to marginal weather and short growing season. They are found near water and cultivated areas.
- Moderage waterfowl populations with stable resident populations. Major hunted species include: Canada Goose, Mallard, Pintail, Gadwall, and Teal. An overall decline in numbers is due to declining conditions elsewhere. Eagle Lake provides important habitat for migrating waterfowl. Nesting occurs throughout the planning unit, but reproductive success is below potential due to reduced cover adjacent to wetland areas.

Threatened and Endangered (T & E) Animals

The Bald Eagle (Federally listed as "threatened") is the only T & E animal known to occur within the planning unit and is found in the Eagle Lake Basin. Populations have been stable or slowly increasing over the past 20 years. The Eagle Lake Basin includes:

- 7 nesting territories of which 3 are located on public land.
- 5 active nesting pairs of which 2 are located on public land.
- Up to 40 birds wintering on public lands.

Fisheries

Eagle Lake, the second largest fresh water natural lake entirely within California, supports a trophy fishery with the unique Eagle Lake trout. This resource is not significantly affected by livestock grazing.

Willow Creek is the only significant fishing stream in the planning unit. Of the 10 miles of trout habitat, 6.25 miles are on public land. Willow Creek is, at best, only a fair trout stream. The dominant game fish is Brown Trout. The major problem in Willow Creek is reduced riparian stream cover, the result of historic beaver use and subsequent utilization by livestock. The reduced cover results in:

- Extreme summer maximum water temperatures (as high as 28°C).
- A relatively high percentage of eroding banks (over 25% of stream banks).
- Less than 10 percent stream bank cover.

Special Habitat Types

There are numerous stringer meadows scattered throughout the planning unit. These generally occur as small areas in association with perennial water sources and are very often found on private land. Vegetation includes sedges, rushes, rabbitfoot grass, and wildrye. Meadows within the planning unit:

- Are very important for sage grouse brood rearing.
- Provide succulent forbs and grasses for pronghorn and mule deer.
- Are in the following condition: 18% good, 65% fair, 17% poor.

The riparian vegetation along watercourses generally receives heavy pressure from livestock concentrations and is in a slow decline in condition. These areas provide important cover for the fishery resource, small mammals, nongame birds, and the California quail. Vegetation includes willows, cottonwood, aspen, sedges, and rushes.

Although constituting only very small, scattered portions of the planning unit, bitterbrush and mahogany communities provide an important food source and cover for mule deer and other wildlife species. Generally, these areas are declining due to a very low rate of reproduction.

Recreation

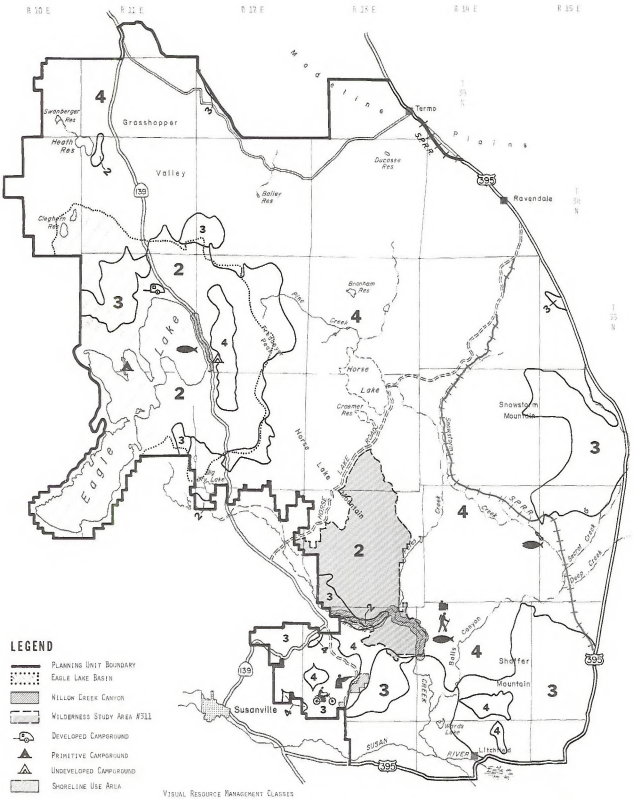
Eagle Lake

Eagle Lake, the major recreational use area in the planning unit, is popular for shoreline fishing, camping, sightseeing, and boating. The use season runs from April through October with spring and fall the peak seasons for the shoreline areas (U. S. Department of the Interior, 1981b). BLM use areas, shown on MAP 3-6, include:

- North Eagle Lake Campground: a 19 unit developed campground with a 5 year average annual use (1976-80) of 2,066 visitor days.
- Highway 139: an undeveloped shoreline camping area with a 5 year average annual use of 1,798 visitor days.
- Rocky Point Campground: a primitive camping area with limited facilities showing a 5 year average annual use of 790 visitor days.

Livestock grazing, shoreline fishing, picnicking, and camping all occur in the same areas along the lake shoreline west of Highway 139 and along the east shore of Rocky Point. Livestock adversely affect the natural appearance of these areas by grazing shoreline vegetation and aquatic plants (tules), and causing other associated impacts.

An Eagle Lake Basin Interagency Board of Directors was established in October, 1977. Member Agencies include the Bureau of Land Management, Lassen National Forest, Lassen County Board of Supervisors, California Department of Fish and Game, and California State Lands Commission. Their purpose is to determine the optimum mix, levels, and locations of use and development that would preserve and enhance the uniqueness and integrity of Eagle Lake and to develop



LEGEND

- Planning Unit Boundary
- Eagle Lake Basin
- Willow Creek Canyon
- Wilderness Study Area #311
- Developed Campground
- Primitive Campground
- Undeveloped Campground
- Shoreline Use Area
- Fishing
- Hiking
- Sightseeing
- Rifle Range
- Off Highway Vehicle Area

Visual Resource Management Classes

Class 2 Changes caused by a management activity should not be evident in the characteristic landscape. A contrast may be seen but should not not attract attention.

Class 2 Interim Class 2 criteria apply to Wilderness Study Areas until Congress acts on completed wilderness studies.

Class 3 Contrasts may be evident and begin to attract attention. Changes should remain subordinate to the existing landscape character.

Class 4 Contrasts may attract attention and be a dominant feature of the landscape. Changes should repeat the basic elements (i.e. form, line, color, texture) inherent in the characteristic landscape.

WILLOW CREEK PLANNING UNIT
RECREATION, VISUAL AND WILDERNESS RESOURCES

general policy statements and specific recommendations regarding major land use issues affecting the Eagle Lake Basin. Policies serve as guidelines for management actions in the Eagle Lake Basin by member agencies. Significant management actions in the basin are reviewed by the Interagency Board prior to implementation.

Willow Creek Canyon

Readily available from Susanville (MAP 3-6), this scenic canyon is popular for fishing, hiking, and sightseeing and receives moderate use. Livestock adversely affect the canyon's recreation and scenic qualities by:

- Heavily grazing streambank willow-riparian vegetation.
- Eroding streambanks.
- Degrading water quality.
- Reducing fishing opportunities.
- Impairing contact recreation by increasing bacteria levels, turbidity, and algal growth.

Other Recreation Use Areas

The Rice Canyon Off-Highway Vehicle Play Area and the Rice Canyon rifle range area are shown on MAP 3-6, but are not significantly affected by livestock grazing and therefore are not discussed further in this document.

Off Highway Vehicle (OHV) Use

OHV use is scattered throughout the planning unit and is often associated with other recreation activities such as hunting.

Hunting

Hunting occurs throughout the planning unit. The most popular species, deer and pronghorn, have averaged an annual hunting pressure of 11,549 and 125 visitor days, respectively, over a 3 year period (1978-80) (U. S. Department of the Interior, 1981). Other species hunted are, in descending order of hunting pressure, chukar, quail, sage grouse, dove, and waterfowl.

Visual Resources

The planning unit is divided into three Visual Resource Management (VRM) classes. Determination of a VRM class is based on three factors: 1) scenic quality rating, 2) sensitivity evaluation (public attitudes and volume of use), and 3) visual zones. MAP 3-6 shows the areas within each class and indicates the allowable visual change within the rated areas.

Wilderness

The Tunnison Mountain Wilderness Study Area (WSA), encompassing 21,460 acres, is the only WSA in the planning unit (MAP 3-6). The wilderness study is scheduled for 1984-85 with the suitability report to Congress due in 1987. The area is currently managed under Interim Management Policy which allows existing uses with restrictions and allows new uses subject to nonimpairment criteria. The WSA contains:

- Mountainous, moderately steep slopes with small peaks.
- Scattered to dense juniper and some pine vegetation.
- Willow Creek Canyon, a verdant perennial canyon stream with limited fishery.
- Some man-made features (i.e., water developments, fences).
- Outstanding opportunities for primitive recreation; big and upland game hunting, fishing, nature study, and cultural resource viewing.

Cultural Resources

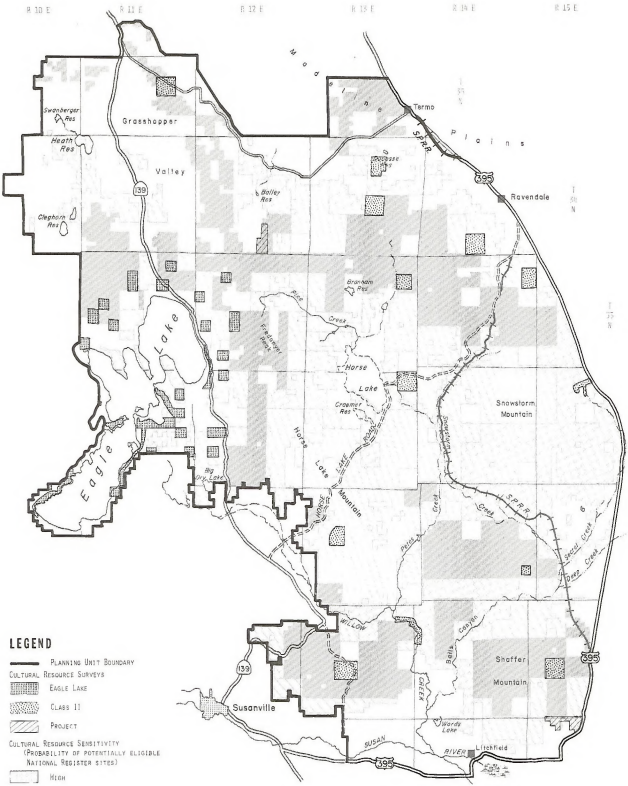
- Approximately 5 percent public land surveyed (MAP 3-7).
- 136 sites recorded (86 on public land).
- 1,720 sites predicted on public land.
- No sites on National Register of Historic Places - 2 sites eligible.
- 7 archaeological districts (containing over 100 sites) and 5 archaeological sites believed eligible for National Register.
- Native Americans are interested in protection of sites, particularly traditional collecting, gathering, and hunting locations, sacred and burial areas. These interests will be addressed on a case-by-case basis during subsequent project planning and environmental assessment processes as required by the Native American Religious Freedom Act and a Memorandum of Understanding (MOU) with the California Native American Heritage Commission.

Survey methodology and results are described in APPENDIX C.

Social and Economic Conditions

Population

- Region (Lassen Co.) (1980): 21,800 (California Health and Welfare Agency, 1981).
- Percent growth (1970-1980): 29.8%.
- Similar growth expected in future.



WILLOW CREEK PLANNING UNIT

CULTURAL RESOURCE SURVEYS AND SENSITIVITY

Industry and Employment

TABLE 3-5
Wage and Salary Employment - 1980[1/]

Industries	LASSEN COUNTY No. of Employees	LASSEN COUNTY Percent	CALIFORNIA Percent
Agricultural, Forestry, Fisheries, and Other	175	2	4
Construction and Mining	350	5	5
Manufacturing	650	9	20
Transportation and Public Utilities	275	4	5
Wholesale and Retail Trade	1,025	14	23
Finance, Insurance, and Real Estate	225	3	6
Services	1,025	14	20
Government (Federal, State, County, and City)	3,500	49	17
Total, All Industries	7,225	100	100

1/ California Health and Welfare Agency, 1981.

Lassen County Livestock Industry-1980 (California Department of Agriculture, 1980)

- Meat sales: $12,100,000.
- 36% of regional agricultural production value.
- 72,000 cattle in region.

Willow Creek Planning Unit Livestock Operators

- 22 Operators (all cattle).
- 20 Primarily family livestock enterprises.
- Provide 24 percent of region's cattle.
- Graze 23,257 AUMs of forage on public land.
- 6 Operators use National Forest lands.

TABLE 3-6
Analysis of Willow Creek Livestock Operators

	Operators 1/		
	Part-Time/Small	Medium	Large
Number of Operators	7	7	8
Average Herd Size	80	346	1,812
Total AUMs Obtained from Willow Creek Allotments	2,203	3,777	17,277
Percent of Total Willow Creek Livestock Forage	10	16	74
Average Percent of Annual Forage Requirements Obtained from Willow Creek Allotments (Dependency)	30	13	10
Range of Dependency (Percent)	14-54	5-24	2-46

1/ Operators: Part-Time/Small = 0-150 Head; Medium = 150-500; Large = 500+.

Chapter 4

Environmental Consequences

Chapter 4

ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter provides the scientific and analytic basis for the selection of the preferred alternative. It discusses the significant impacts that are anticipated to result from implementation of the Proposed Action and each of the alternatives. Both the beneficial and adverse impacts affecting the environmental components, as discussed in Chapter 3, will be documented. This chapter also includes: mitigating measures (not included under Standard Operating Procedures of Chapter 2) needed to enhance beneficial impacts or lessen adverse impacts; unavoidable adverse impacts which cannot be mitigated; the relationship between short-term use and enhancement of long-term productivity; and irreversible or irretrievable commitment of resources.

Knowledge of the area and professional judgment, based on observation and analysis of similar conditions and responses in similar areas, have been used to infer environmental impacts where data is limited.

The analysis of alternatives is organized by issues:

- Wildlife-livestock conflicts.
- Economics.
- Management of Eagle Lake Basin.
- Protection of Willow Creek values.
- Range condition and production.

Based on the following assumptions:

- Near-normal annual precipitation.
- Five year implementation (1984 through 1988).
- Funds and personnel available for implementation.
- Impacts will be monitored and adjusted as necessary.
- Minor adjustments in management may occur.
- Short term refers to five years, long term twenty years.
- Water will be available at obtainable depths, and water rights will be granted by the State Water Resources Control Board.
- Baseline data accurate.
- Allotment management plans (AMPs) written during 1983-84. Environmental assessments completed before starting any project.
- Additional forage allocations for livestock made only if additional forage is permanently available.
- Economic impacts based on 1980 prices.

IMPACTS OF THE ALTERNATIVES

Alternative A - Proposed Action

Issue 1 - Wildlife-Livestock Conflicts

The Proposed Action should provide overall enhancement of wildlife habitat.

The following assumptions are made concerning the vegetation treatments:

- Seedings will result in 100 percent brush removal.
- Brush control will result in 60 to 80 percent brush removal.
- Fire breaks will result in 40 to 60 percent brush removal.

Mule Deer: The following impacts on mule deer would be expected:

- Slow overall improvement in deer habitat.
- Decreased competition for forbs and preferred browse species due to improved livestock distribution and increased preferred livestock forage from land treatments.
- Improvement of winter range in the Johnston-Chappuis Allotment due to a 61 percent reduction in livestock use.
- Greater water availability from proposed water developments.
- Benefits to deer habitat from noxious weed control although the area proposed for control is currently marginal deer range.
- A 7 percent reduction in browse species, primarily sagebrush, due to brush control and fuel breaks. However, these treatments should benefit habitat by enhancing the growth of grasses and forbs and creating "edge" interspersion and diversity.
- An additional 1 percent reduction in sagebrush due to the proposed seeding. The seed mixture for the seeding would include forbs and browse species beneficial to wildlife.
- Fluctuation in deer numbers with probable increase from 6,600 toward objective numbers of 11,100 animals as a result of increased fawn survival and decreased winter mortality. Also, the California Department of Fish and Game has recommended a quota hunt for this area which would reduce hunter pressure by 80 percent (11,549 to 2,250 hunter days).

Pronghorn: The following impacts on pronghorn would be expected:

- Slow overall improvement in pronghorn habitat.
- Decreased competition for forbs and preferred browse species.
- Greater water availability and improved habitat from water developments, brush control, fuel breaks, and seedings (similar to impacts on mule deer).
- Benefits to pronghorn habitat from noxious weed control. The 38,300 acre noxious weed control area occurs in pronghorn winter range. The intent of this treatment is to reduce medusahead and encourage establishment of other annual and perennial grasses, forbs, and browse. Total habitat change is not expected because of terrain, soil, and persistence of the existing vegetation. Any success would be beneficial to pronghorn as well as to other wildlife species.

- 10 percent reduction in juniper canopy designed to open the canopy and allow increased grass, forb, and browse production, thus benefitting pronghorn.
- Slight restriction in pronghorn movement from the proposed 87 miles of fence. The greatest concern would be the two places where fences cross migration corridors (California Department of Fish and Game, 1981).
- Probable increase in pronghorn numbers from 800 toward the objective number of 1,250 wintering animals.

Sage Grouse: Slight increase in populations due to decreased grazing pressure on semiwet meadows and overall habitat improvement as a result of water developments and implementation of grazing systems.

Other Game Birds: Slight increase in chukar base populations due to increased water availability. Slight increase in quail base populations due to increased water availability and improved cover. Increase in mourning dove populations due to greater production of forbs and associated seed sources. Slight increase in waterfowl populations due to more even distribution of water. The Snowstorm wetland exclosure would greatly benefit waterfowl.

Threatened and Endangered Animals: Possibly a very slight improvement in Bald Eagle habitat due to protection of the Willow Creek corridor.

Fisheries: Improvement of the fishery resource in Willow Creek as a result of the Willow Creek exclosure. Streambank vegetation should increase to its full potential. The resulting cover should decrease erosion and reduce summer maximum water temperatures through shading.

Special Habitat Types: Improved livestock management, better distribution, and grazing systems would slightly enhance all special habitat types (riparian, aspen, semiwet meadows, bitterbrush, and mahogany areas). The protection of key areas such as Willow Creek, Eagle Lake shoreline, and the Snowstorm wetland would allow these areas to achieve their full potential.

Issue 2 - Social and Economic Conditions

Livestock Industry:

In the short term, cattle sales would:

- Increase by $59,000 (annually) due to an 18 percent increase of 4,190 AUMs of livestock use.
- Increase regionally by 0.5 percent.

Over the long term, cattle sales would increase by up to $72,000 (annually) depending on how much of the estimated additional 5,139 AUMs (22 percent increase over present) were allocated to livestock use.

Recreation-Based Employment:

Recreation-based employment would increase by up to six seasonal jobs (retail and services sectors primarily) from increased hunter expenditures.

Livestock Operators:

The following changes in profitability of representative 200/1,000 head cattle operations in the planning unit would be expected:

Operator Response 1/	Income Above Cash Costs 2/	
	200 Head	1,000 Head
Increase Herd Size	$17,900	$32,700

1/ Compares with existing profitibility of $17,000 and $28,600, respectively.

2/ Does not include costs such as mortgage payments, depreciation, and family labor.

The following impacts on the Willow Creek livestock operators would be expected:

	Size of Ranch Operation		
	Part-Time/ Small	Medium	Large
Number of Operators	7	7	8
Number of Operators Substantially Affected (Threshold: 10% of total annual forage supply lost or gained)			
- Short Term	1 (gain)	0	1 (gain)
- Long Term	1 (lost)	0	1 (gain)
AUM Allocation to Livestock			
5 Years (Short Term)	2,423	4,351	20,673
- Percent Change from Existing	+10	+15	+20
- Range of Percent Change by Operator	0 to 33	0 to 22	0 to 92
- Percent of Total Willow Creek Livestock Allocation	9	16	75
20 Years (Long Term)	2,020(max)	4,529(max)	21,847(max)

Issue 3 - Management of Eagle Lake Basin

The proposed action would generally improve the environmental, recreational, and visual qualities of the Eagle Lake Basin.

Proposed restrictions on grazing along Eagle Lake shoreline west of Highway 139 and along east shore of Rocky Point would:

- Effectively eliminate major livestock-shoreline user conflicts on public land.
- Reduce livestock grazing's impact on shoreline and near-shore aquatic vegetation during primary recreation use season.
- Not completely eliminate livestock-recreation conflicts on Rocky Point's east shoreline during October when improved fall shoreline fishing attracts sporadic day and overnight recreation use at Rocky Point.
- Reduce cultural resource site deterioration.
- Improve scenic quality along lake shore areas where livestock are excluded.
- Reduce hazard of cattle wandering on Highway 139.

Proposed brush control located in the Slate Creek Allotment falls within a proposed Class II Visual Resource Area. Brush control through burning in this area would create a short term visual change that would be visible from Highway 139, but should not attract attention and should assume a natural appearance within one to two years of the action. Proposed Action would meet VRM objectives with Bureau adherence to standard operating procedures.

Eagle Lake would experience an insignificant decrease in littoral muck disturbance, pathogen content, sediment, and nutrient delivery. The range management portion of the Best Management Practice for water resources would be satisfied for Eagle Lake.

Issue 4 - Protection of Willow Creek Values

Removing livestock grazing from the Willow Creek Canyon (except for possible water gaps) would produce an overall improvement in environmental, recreational, visual, and cultural resources. Specific impacts on the Willow Creek Canyon would include:

- Significant decrease in soil compaction and streambank deterioration and significant increase in soil cover.
- Slight improvement in water quality. Lowering of stream temperatures by approximately 1°C, increase in dissolved oxygen by 1-2 mg/l during low flow periods, and a significant reduction in water borne pathogens. Range management portion of the Best Management Practices for water resources would be satisfied.
- Significant improvement in fish and wildlife cover, streambank stability, and decreased erosion resulting in improved fishery potential.
- Reduced cultural resource site deterioration.
- Improved attractiveness for fishing, hiking, swimming, and sightseeing.
- Enhancement of scenic quality through vegetation regrowth.
- Visual resource management objectives would be met.

Issue 5 - Range Condition and Production

The Proposed Action would improve and maintain range condition and production through intensive management, additional land treatments, and improved livestock distribution

General Impacts:

Over the next 20 years, the following changes would be expected (TABLE 4-1):

- Sparse woodland canopy class would decline, resulting in a 25 percent decrease from 18,613 acres to 13,925 acres.
- Medium woodland canopy class would increase, resulting in a 20 percent increase from 1,115 acres to 1,333 acres.
- Poor condition range would improve, resulting in an 11 percent decrease from 60,140 acres to 53,503 acres.
- Fair condition range would improve, resulting in a 1 percent decrease from 161,194 acres to 161,003 acres.
- 1 percent increase in suitable rangeland (TABLE 2-1).
- 43 percent overall increase in good condition range.

The Proposed Action would allow vegetation to improve in composition, cover, and structure where the potential exists during the next 20 years.

Lack of significant improvement in some vegetation types due to:

- Poor soils.
- Low precipitation.
- Competition with invader species.
- Low plant vigor.
- Insufficient seed source.

Allotments dominated by poor condition range would have less potential for improvement and an anticipated slower rate of recovery because of the low percentage of key range plants, competition of annual species, dense sagebrush canopies, and a higher degree of active erosion. Allotments with significant acreages of fair and good condition range would have a greater potential for improvement and an anticipated faster recovery rate because of the presence of key species in sufficient numbers and vigor for successful reproduction.

Allotments with intensive management systems (AMPs), season of use adjustments, utilization limits, and vegetation manipulations would benefit in the following manner:

- Increase suitable rangeland.
- Improve livestock distribution and utilization (Heady, 1975; Stoddart et al., 1975).
- Maintain good-excellent range condition.
- Improve plant vigor, seeding production, and litter accumulation (Hormay, 1970).
- Increase forage production.

TABLE 4-1

Rangeland Condition, Woodland Canopy Class, and Production in 20 Years
Alternative A - Proposed Action

ALLOTMENT	RANGELAND CONDITION[1/] (ACRES/PERCENT) Excellent and Good	Fair	Poor	WOODLAND CANOPY CLASS[1/] (ACRES/PERCENT) Dense	Medium	Sparse	BARREN LAND[1/] (Acres/Percent)	TOTAL[1/] (Acres)	PRODUCTION (AUMs)
Walton	0	461/50	0	197/21	27/3	245/26	0	930	73
Said Valley	164/11	1,208/78	138/9	0	0	0	35/2	1,545	203
Buffam-Metcalf	177/4	2,906/70	802/19	0	0	0	279/7	4,165	274
Dry Valley	9/2	309/68	120/27	0	0	0	15/3	453	53
New Bailey Creek	2,816/18	10,894/69	386/3	76/<1	0	0	1,397/9	16,569	2,231
Williams	0	2,750/89	1/<1	3/<1	28/1	94/3	182/6	3,058	457
New Ravendale	5,224/18	23,544/70	763/2	0	0	727/2	2,219/8	32,477	4,148
Crest	72/1	4,223/36	6,087/51	0	0	425/4	1,028/8	26,874	908
North Horse Lake	6,132/23	15,764/59	1,055/4	1,641/6	278/1	938/3	1,066/4	27,529	3,499
Slate Creek	3,502/13	13,219/48	1,011/4	1,961/7	239/1	6,253/23	1,344/4	5,154	2,123
Bucks Bay	1,327/25	2,394/46	75/1	677/13	62/1	557/11	62/1	1,263	728
Hansen	11/1	729/58	387/31	0	0	31/2	105/8	11,835	160
Snowstorm	5,986/14	22,231/51	9,777/22	0	0	3/<1	5,684/12	43,681	4,638
Erick	158/6	1,649/67	518/21	0	0	0	150/6	2,475	203
Wood	21/1	2,060/94	87/4	0	12/1	0	9/<1	2,189	232
Cottonwood	0	1,593/94	0	0	0	49/3	50/3	1,692	142
Stone	2/<1	524/60	0	0	33/4	295/33	28/3	882	82
Walsh Mountain	440/9	1,602/33	254/5	245/5	513/11	1,365/29	361/8	4,780	283
Barron	96/2	3,062/70	248/6	78/2	12/1	95/2	718/17	4,309	134
South Horse Lake	3,655/9	29,496/71	4,237/10	165/<1	0	1,506/4	2,610/6	41,669	3,166
Humphrey 3-C	5/<1	546/10	4,328/84	0	0	0	217/4	5,096	386
Tablelands	18/<1	1,844/11	13,349/82	0	0	0	1,049/7	16,260	1,765
Coffin	223/21	197/18	0	35/3	35/3	490/47	82/8	1,062	77
Rice Canyon	957/9	6,119/51	2,377/22	0	49/<1	443/4	855/8	10,800	685
Johnson-Chappuis	34/1	2,422/36	2,917/43	326/5	45/<1	409/6	615/9	6,768	298
Shaffer	6,791/28	9,256/38	4,586/19	0	0	0	3,830/15	24,463	1,448
TOTALS	37,820/13	161,003/54	53,503/18	5,404/2	1,333/<1	13,925/5	23,990/8	296,978	28,396
CHANGE FROM PRESENT	+42%	-<1%	-11%	+3%	+20%	-25%	0		+22%

1/ Rangeland + Woodland + Barren Land = Total Land

Total of 269.5 acres disturbed in short term through range improvements:

- 87 acres by fences.
- 182 acres by water developments and cattleguards.

Vegetation manipulation would:

- Greatly reduce native shrubs, juniper trees, and, depending on manipulation method, some broadleaf forbs in treated areas.
- Stimulate native herbaceous understory such as perennial grasses and annual forbs.
- In the long term, result in reestablishment of native shrubs and juniper in treated areas unless follow-up treatments were periodically used.

As range condition improved over the next 20 years, production would increase by 22 percent from 23,242 AUMs to 28,396 AUMs as shown in TABLE 4-1.

Specific Impacts by Allotment:

The following allotments would not change significantly in 20 years under the proposed action:

Walton	Said Valley	Bucks Bay
Buffam-Metcalf	Dry Valley	Johnston-Chappuis
Williams	Hansen	Rice Canyon
Erick	Stone	Coffin
Walsh Mountain	Barron	Humphrey 3-C

Cottonwood and Wood Allotments: Controlled burning of brush overstory would stimulate herbaceous understory resulting in improvement of fair condition range to good (1,600 acres and 2,200 acres, respectively by allotment).

New Bailey Creek: Development of 3,000 acre seeding and implementation of an AMP would allow spring use on the seeding while deferring use on the native range each year. This would result in:

- Improved plant vigor, seed production, and litter accumulation (Hormay, 1970).
- Faster rate of plant succession and improvement in range condition.
- 51 percent increase in vegetation production.

Slate Creek: The proposed allotment boundary adjustment and developments, including a 1,000 acre controlled burn to decrease fuel loads, would:

- Increase suitable range and improve range condition and utilization patterns.
- Reduce heavy livestock concentrations.
- Increase vegetation production by 16 percent.

South Horse Lake: The proposed 4,100 acre controlled burn of brush overstory would stimulate herbaceous understory while reducing fire danger in the Allotment. The proposed range improvements, including a 2,500 acre noxious weed control program, would:

- Improve livestock distribution.
- Improve poor range condition and maintain fair and good range condition lands while maintaining vegetation production.

Crest: The proposed boundary adjustments and range improvements, along with implementation of an AMP, would:

- Improve poor condition range.
- Reduce heavy livestock concentrations.
- Increase vegetation production by 10 percent.

New Ravendale: The proposed range improvements, including 15,000 acres of brush control, deferring turn out dates 15 days, and implementation of an AMP would:

- Improve plant vigor, seed production, and overall range condition.
- Increase good range condition.
- Increase vegetation production by 46 percent.

North Horse Lake: The proposed range improvements, including 8,000 acres of brush control, and implementation of an AMP would:

- Improve poor condition and maintain good condition range.
- Increase vegetation production by 32 percent.

Snowstorm: The proposed range improvements, including a 13,000 acre noxious and invader weed control program, and implementation of an AMP would:

- Improve livestock distribution.
- Improve fair condition and maintain good condition range.
- Increase vegetation production by 23 percent.

Tablelands: The proposed range improvements, including a 16,000 acre noxious and invader weed control program, would:

- Improve livestock distribution.
- Improve poor condition and maintain fair condition range.
- Increase vegetation production by 147 percent.

Shaffer: The proposed range improvements, including a 2,400 acre noxious weed control program, would:

- Improve livestock distribution.
- Improve poor condition and maintain fair and good condition range.
- Increase vegetation production by 3 percent.

See APPENDIX A for methodology for assessing 20 year changes in vegetation condition and production.

Non Issue Related Impacts

Soil: The implementation of grazing systems leading to improved range condition would result in an overall decrease in soil erosion. There would also be a slight increase in vegetation litter and soil moisture. However, soil values in unprotected semi-wet meadows would continue to be degraded through compaction and gullying, resulting in a lowered water table and reduced available soil moisture. The soil erosion problem in Rice Canyon would continue. Where fire or mechanical treatment is used, short term impacts to the soil would include increased runoff and erosion during peak precipitation events. In the long term, the extensive vegetation manipulation projects would greatly improve soil condition in those areas. This would result in a significant improvement in water holding capacity, infiltration, runoff, and erosion conditions.

Water Resources: There would only be site specific improvement in water quality, where livestock would be excluded and along perennial streams where livestock concentrate. There would be no detectable area-wide increase in water quantity available for use.

Threatened and Endangered Plants: If medusahead control in the Snowstorm Allotment involved spraying during spring and summer months with a broadleaf eradicating herbicide, *Lomatium ravenii* would be destroyed within the treated area.

Livestock Performance: Livestock performance should improve with the improved management under the Proposed Action. The proposed AMPs, range improvements, and land treatments would improve range condition and increase forage quantity and quality, thereby increasing the potential for improved livestock perofrmance. There would be a short term period of decreased performance while livestock adjust to a new grazing system.

Wild Horses: Under the Proposed Action, the 15 wild horses would be maintained at existing numbers and condition with no significant impacts from proposed land treatments or range developments.

Recreation: Hunting opportunities for deer and pronghorn would gradually increase as herd sizes increased. Methods for determining increases are based on techniques used in the Cal-Neva EIS (U. S. Department of the Interior, 1981a). If big game populations increased to objective numbers (11,100 deer and 1,250 pronghorn), hunter days would increase over present use by up to 68 percent for deer and 56 percent for pronghorn.

Sage grouse, quail, and chukar hunting opportunities should improve as upland game populations increase.

Off-highway vehicle use opportunities would remain unchanged as long as gates and cattleguards are installed where proposed fencing crosses existing travel routes.

Visual Resources: Scenic quality would be adversely impacted in the short term by the two brush control treatment areas in the North Horse Lake and New Ravendale Allotments. However, long term impacts should not significantly affect scenic quality as both treatment areas are located within Visual Resource Management Class IV areas, which allow for major visual changes in the landscape.

Wilderness: Although the Proposed Action would exceed "grandfathered" grazing use, it would meet IMP nonimpairment criteria and would be allowable under the Bureau's Wilderness Management Policy, if the area was designated wilderness.

- Additional livestock would cause neither a decline in vegetation or soil conditions nor unnecessary or undue degradation of the land.
- New range improvements, though creating minor impacts on naturalness and solitude, would help improve and protect the condition of the rangeland.
- Livestock restriction fence along Willow Creek would protect and improve wilderness values.

Cultural Resources: With increased livestock use, trampling and other livestock related impacts would continue:

- Breakage of surface materials.
- Displacement of spatial patterning.
- Mixture of near-surface vertical deposits.
- Most pronounced at water sources (livestock congregation areas).

Increased impacts would occur in the Tablelands and New Ravendale Allotments, where many National Register quality sites are known to exist. Better overall distribution of livestock and improved or maintained range conditions with decreased erosion would generally reduce impacts to cultural resources. Benefits would be greatest in the Snowstorm and Crest Allotments, where livestock use would be reduced. Land treatments could seriously impact cultural resource sites if surface disturbance methods (i.e., plowing, chaining, and brush beating) were used.

Alternative B - Decreased Livestock Use

Issue 1 - Wildlife-Livestock Conflicts

The Decreased Livestock Use alternative would provide moderate overall enhancement of wildlife habitat due to a 34 percent decrease in livestock use.

The same assumptions are made concerning vegetation treatments as described under Proposed Action.

Mule Deer: The following impacts on mule deer would be expected:

- Moderate overall improvement in deer habitat.
- Decreased competition for preferred forbs and browse species.
- Improvement of winter range in the Johnston-Chappuis Allotment due to 75 percent reduction in livestock use.

- Improvement of deer fawning habitat by delaying livestock turnout.
- Enhancement of deer winter range by removing livestock early.
- Slight increase in water availability from additional reservoirs.
- Same benefits from the proposed seeding and noxious weed control as for the Proposed Action.
- Same increase in mule deer populations as for the Proposed Action, but increases would occur sooner.

Pronghorn: The following impacts on pronghorn would be expected:

- Moderate overall improvement in pronghorn habitat.
- Decreased competition for preferred forbs and browse species.
- Enhancement of pronghorn kidding habitat by delaying livestock turnout.
- Improvement of pronghorn winter range by removing livestock early.
- Slight increase in water availability from additional reservoirs.
- Same benefits from the proposed fencing, seeding, and noxious weed control as for the Proposed Action.
- Increase in pronghorn population from 800 toward the objective numbers of 1,250 wintering animals due to increased kid survival and decreased winter mortality.

Sage Grouse: Moderate increase in populations due to reduced grazing pressure on semiwet meadows, shortened livestock season of use, and increased water availability.

Other Game Birds, Threatened and Endangered Animals, and Fisheries: Same as for Proposed Action.

Special Habitat Types: Decreased livestock use, a shortened use season, and better livestock distribution would slightly enhance all special habitat types (riparian, aspen, semiwet meadow, bitterbrush, and mahogany areas). The protection of Willow Creek, Eagle Lake shoreline, and the Snowstorm wetland would allow these areas to achieve their full potential.

Issue 2 - Social and Economic Conditions

Livestock Industry:

In the short term, cattle sales would:

- Decrease by $112,000 (annually) from a 34 percent decrease of 7,979 AUMs of livestock use.
- Decrease regionally by 0.9 percent.

Over the long term, cattle sale losses could vary between $112,000 and $55,000 depending on how much of the estimated additional 4,035 AUMs were allocated to livestock use.

Recreation-Based Employment:

Same as for Proposed Action.

Livestock Operators:

The following decreases in profitability of representative 200/1,000 head cattle operations in the planning unit would be expected:

Operator Response[1/]	Income Above Cash Costs[2/] 200 Head	1,000 Head
Rent Private Pasture ($10/AUM)	$15,800	$25,700
Reduce Herd Size	$15,500	$19,300

1/ Compares with existing profitability of $17,000 and $28,600, respectively.
2/ Does not include costs such as mortgage payments, depreciation, and family labor.

The following impacts on the Willow Creek livestock operators would be expected:

	Size of Ranch Operation		
	Part-Time/ Small	Medium	Large
Number of Operators	7	7	8
Number of Operators Substantially Affected (Threshold: 10% of total annual forage supply lost or gained)			
- Short Term	4 (lost)	1 (lost)	1 (lost)
- Long Term	4 (lost)	1 (lost)	0
AUM Allocation to Livestock			
5 Years (Short Term)	1,396	2,048	11,834
- Percent Change from Existing	-37	-53	-32
- Range of Percent Change by Operator	-19 to -62	-23 to -68	-25 to -39
- Percentage of Total Willow Creek Livestock Allocation	9	13	78
20 Years (Long Term)	1,499(max)	2,538(max)	15,276(max)

Issue 3 - Management of Eagle Lake Basin

This alternative would improve the environmental, recreational, and visual qualities of the Eagle Lake Basin.

Eliminating livestock use from all public land portions of the Eagle Lake shoreline would:

- Eliminate livestock-recreation user conflicts along all BLM shoreline.
- Increase natural appearance of public shoreline areas and near shore aquatic plants for recreational enjoyment.
- Reduce cultural resource site deterioration.
- Significantly improve littoral and shore zone soil condition due to increased soil cover and vegetation and reduced trampling.
- Protect Eagle Lake water quality from livestock impacts (i.e., littoral muck disturbance, defecation, devegetation, and sediment delivery), although any improvement in water quality would not be measurable. This alternative would meet the Best Management Practices for the protection of water quality.

Issue 4 - Protection of Willow Creek Values

Same impacts as for Proposed Action with a very slight additional improvement by eliminating all livestock access to Willow Creek.

Issue 5 - Range Condition and Production

The Decreased Livestock Use Alternative would improve and maintain range condition through the following:

- Reduced livestock grazing.
- Delayed turnout dates.
- Improved distribution and utilization through water developments.
- Vegetation manipulation.
- Implementation of AMPs to benefit non-livestock resources.

General Impacts:

Over 20 years, the following changes would be expected (TABLE 4-2):

- Sparse woodland canopy class would decline, resulting in an 8 percent decrease from 18,613 acres to 17,141 acres.
- Medium woodland canopy class would increase, resulting in a 101 percent increase from 1,115 acres to 2,244 acres.
- Poor condition range would improve, resulting in a 5 percent decrease from 60,140 acres to 56,858 acres.
- Fair condition range would improve, resulting in a 2 percent decrease from 161,194 acres to 158,447 acres.
- 1 percent increase in suitable rangeland (TABLE 2-4).
- 23 percent overall increase in good condition range.

TABLE 4-2

Rangeland Condition, Woodland Canopy Class, and Production in 20 Years
Alternative B - Decreased Livestock Use

ALLOTMENT	RANGELAND CONDITION[1/] (ACRES/PERCENT) Excellent and Good	Fair	Poor	WOODLAND CANOPY CLASS[1/] (ACRES/PERCENT) Dense	Medium	Sparse	BARREN LAND[1/] (Acres/Percent)	TOTAL[1/] (Acres)	PRODUCTION (AUMs)
Walton	46/5	415/45	0	197/21	27/3	245/26	0	930	80
Said Valley	285/19	1,087/70	138/9	0	0	0	35/2	1,545	223
Buffam-Metcalf	462/11	2,564/61	860/21	0	0	0	279/7	4,165	301
Dry Valley	39/9	270/59	129/29	0	0	0	15/3	453	58
New Bailey Creek	2,424/16	10,502/67	386/3	76/1	162/1	622/4	1,397/8	16,569	2,454
Williams	0	2,750/89	1/<1	3/<1	28/1	94/3	182/6	3,058	457
New Ravendale	64/<1	23,151/71	3,420/10	0	0	3,623/11	2,219/8	32,477	3,133
North Horse Lake	4,086/15	17,052/64	1,187/4	1,684/6	391/2	1,408/5	1,066/4	26,874	2,925
Slate Creek	2,533/8	13,803/50	1,394/5	2,091/8	734/2	5,630/22	1,344/5	27,529	2,009
Bucks Bay	1,327/25	2,394/46	75/1	677/13	62/1	557/11	62/1	5,154	728
Hansen	11/1	729/58	387/31	0	0	31/2	105/8	1,263	160
Crest	72/1	4,223/36	6,087/51	0	0	425/4	1,028/8	11,835	908
Snowstorm	5,986/14	22,231/51	9,777/22	0	0	3/1	5,684/12	43,681	4,638
Erick	158/6	1,649/67	518/21	0	0	0	150/6	2,475	203
Wood	21/1	2,060/94	87/4	0	12/<1	0	9/<1	2,189	232
Cottonwood	0	1,577/93	16/1	0	0	49/3	50/3	1,692	142
Stone	54/6	472/53	0	0	33/4	295/33	28/3	882	82
Walsh Mountain	440/9	1,587/33	269/5	245/5	513/11	1,365/29	361/8	4,780	283
Barron	96/2	3,062/70	248/6	78/2	12/1	95/2	718/17	4,309	134
South Horse Lake	6,579/16	26,312/63	4,495/11	175/<1	141/<1	1,357/3	2,610/6	41,669	3,483
Humphrey 3-C	15/1	719/14	4,155/81	0	0	0	217/4	5,096	386
Tablelands	18/1	1,844/11	13,349/82	0	0	0	1,049/7	16,260	1,765
Coffin	223/21	197/18	0	35/3	35/3	490/47	82/8	1,062	77
Rice Canyon	957/9	6,119/57	2,377/22	0	49/<1	443/4	855/8	10,800	685
Johnson-Chappuis	34/<1	2,422/36	2,917/43	326/5	45/<1	409/6	615/9	6,768	298
Shaffer	6,791/28	9,256/38	4,586/19	0	0	0	3,830/15	24,463	1,448
TOTALS	32,711/11	158,447/53	56,858/19	5,587/2	2,244/1	17,141/6	23,990/8	296,978	27,292
CHANCE FROM PRESENT	+23%	-2%	-5%	+6%	+101%	-87%			+17%

1/ Rangeland + Woodland + Barren Land = Total Land

Most impacts described under the Proposed Action would apply to the Decreased Livestock Use Alternative. However, beyond 20 years, vegetation would improve in condition more than under the Proposed Action. The grazing systems, seasons of use, utilization limits, and range developments would more effectively increase cover and desirable plant species. The most important factor for improving range condition under this alternative would be the shortened season of use.

Proposed range developments would disturb, in the short term, a total of 177.5 acres:

- 84.5 acres by fences.
- 93 acres by water developments and cattleguards.

As range condition improved over the next 20 years through intensive management, reduced livestock grazing, and vegetation manipulation, production would increase by 17 percent (TABLE 4-2).

Specific Impacts by Allotment:

The following allotments would not change significantly in 20 years, but beyond that time they would noticeably improve in range condition and production:

Walton	Dry Valley	Crest
Buffham-Metcalf	Hansen	Shaffer
Williams	Wood	New Ravendale
Erick	Rice Canyon	North Horse Lake
Cottonwood	Barron	Coffin
Humphrey 3C	Said Valley	

New Bailey Creek: Basically, the same impacts as for Proposed Action, except for a 66 percent increase in production rather than the 51 percent increase predicted under the Proposed Action.

Snowstorm and Tablelands: Basically, same as for Proposed Action.

The following allotments would show improved condition and increased production beyond 20 years due to the complete removal of livestock from portions of the allotments (see MAP 2-2):

Stone	Walsh Mountain
Bucks Bay	Johnston-Chappuis
Slate Creek	South Horse Lake
Tablelands	

Non Issue Related Impacts

Soil: Reducing livestock use would generally improve soil condition and decrease erosion. The less severely degraded meadow soils would recover, while gullied and drained meadows, and meadows with headcuts, would continue to deteriorate with the absence of special rehabilitation projects. All streambanks would improve in stability and the Rice Canyon erosion problem would also slightly improve.

Water Resources: Total annual recharge to surface and groundwater systems would remain the same. Surface water storage and distribution would increase with the 31 additional proposed reservoirs while consumption by livestock would be reduced. This alternative would meet Best Management Practices for the protection of water quality.

Threatened and Endangered Plants: Same as for Proposed Action.

Livestock Performance: Same as for Proposed Action, with greater improvement beyond 20 years, associated with increased range condition and production.

Wild Horses: Basically the same as for Proposed Action, with greater improvement in range condition and production beyond 20 years.

Recreation: Deer and pronghorn hunting opportunities would probably increase as described under the Proposed Action, but at a slower rate.

Sage grouse and quail hunting opportunities would improve slightly. Chukar hunting should increase slightly, but less than under the Proposed Action.

Visual Resources: Scenic quality would remain the same or improve slightly.

Wilderness: The suitability of the Tunnison Mountain WSA for preservation as wilderness would be maintained. The proposed two new range developments and the livestock restriction fence along Willow Creek would meet the nonimpairment standards as identified in the Proposed Action. The alternative would be allowed under Bureau Wilderness Management Policy, if the WSA were designated as wilderness.

Cultural Resources: Impacts would be similar to those under the Proposed Action, but with less overall site damage from trampling and with increased protection in some areas such as Eagle Lake. Decreased livestock use within the Crest, Shaffer Mountain, and Snowstorm Allotments would particularly benefit cultural resources by reducing site damage in these potentially significant areas.

Alternative C - Increased Livestock Use

Issue 1 - Wildlife-Livestock Conflicts

The Increased Livestock Use alternative would cause an overall decline in wildlife habitat condition and populations primarily as a result of the 33 percent increase in livestock use and the intensity of the corresponding land treatments.

The same assumptions are made concerning vegetation treatments as described under Proposed Action.

Mule Deer: The following impacts on mule deer would be expected:

- General decline in habitat condition due to AMPs giving priority to livestock over other competitive resources.
- Increased forage competition for preferred browse species, spring forbs, and grasses.
- Improved winter range in the Johnston-Chappuis Allotment due to a 61 percent reduction in livestock grazing.
- Similar benefits from water developments and noxious weed control as discussed under the Proposed Action.
- Reduction in deer habitat from brush control treatments. Although the brush control treatments will "release" grasses and forbs, the intensity of the treatments will effectively reduce the edge, interspersion, and diversity benefits gained from the less intensive treatments described in the Proposed Action. The intensive treatments would result in a 17 percent overall reduction in sagebrush habitat and a 38 percent reduction in juniper habitat. Reduced fawn survival and increased winter mortality would contribute to a decline in deer populations.
- Failure to meet objective deer numbers (11,100).

Pronghorn: The following impacts on pronghorn would be expected:

- General decline in habitat condition due to AMPs giving priority to livestock over other competitive resources.
- More intense forage competition for preferred browse species, spring forbs, and grasses.
- Similar benefits from water developments and noxious weed control, and similar effects of fencing as discussed under the Proposed Action. Although pronghorn would benefit more than deer from the intensive treatments, the net effect would be slightly less than for the Proposed Action, since the seedings would not contain a seed mixture beneficial to wildlife.
- Fluctuation in populations with probable slight decline. Objective numbers (1,250) would not be met.

Sage Grouse: Moderate decrease in populations due to increased livestock concentrations on the already severely impacted semiwet meadows.

Other Game Birds: Slight increase in chukar populations due to increased water availability. Slight decrease in quail populations due to further degradation of riparian cover. Mourning Dove populations would remain below potential due to limited forb production and associated seed sources. Waterfowl production would remain below potential due to reduced cover adjacent to wetland areas.

Threatened and Endangered Animals: Although the Willow Creek corridor does not now support nesting Bald Eagles, a decline in fishery habitat and potential could negatively affect wintering Bale Eagles by reducing their food supply.

Fisheries: Decline in fishery habitat and potential in Willow Creek (see Issue 4).

Special Habitat Types: Increased livestock pressure would cause a slight to moderate decline in all special habitat areas (riparian, aspen, semiwet meadow, bitterbrush, and mahogany areas).

Issue 2 - Social and Economic Conditions

Livestock Industry:

In the short term, cattle sales would:

- Increase by $107,000 (annually) from a 33 percent increase of 7,617 AUMs of livestock use.
- Increase regionally by 0.9 percent.

Over the long term, cattle sales would increase by up to $135,000 (annually) depending on how much of the estimated additional 9,616 AUMs (41 percent increase over present) were allocated to livestock use.

Recreation-Based Employment:

No change.

Livestock Operators:

The following increases in profitability of representative 200/1,000 head cattle operations in the planning unit would be expected:

Operator Response 1/	Income Above Cash Costs 2/	
	200 Head	1,000 Head
Increase Herd Size	$18,300	$35,400

1/ Compares with existing profitability of $17,000 and $28,600, respectively.

2/ Does not include costs such as mortgage payments, depreciation, and family labor.

The following impacts on the Willow Creek livestock operators would be expected:

	Size of Ranch Operation		
	Part-Time/ Small	Medium	Large
Number of Operators	7	7	8
Number of Operators Substantially Affected (Threshold: 10% of total annual forage supply lost or gained)			
- Short Term	2 (gain)	2 (gain)	1 (gain)
- Long Term	1 (gain), 1 (lost)	2 (gain)	1 (gain)
AUM Allocation to Livestock			
5 Years (Short Term)	2,619	5,209	23,046
- Percent Change from Existing	+19	+38	+33
- Range of Percent Change by Operator	0 to 38	0 to 73	0 to 97
- Percentage of Total Willow Creek Livestock Allocation	9	13	78
20 Years (Long Term)	2,538(max)	5,683(max)	24,652(max)

Issue 3 - Management of Eagle Lake Basin

This alternative would generally reduce the environmental, recreational, and visual qualities of the Eagle Lake Basin. Continued grazing practices within the basin would:

- Continue livestock wandering and associated impacts along popular shoreline use areas west of Highway 139 and on Rocky Point.
- Continue grazing of near shore tules and shoreline vegetation in popular shoreline recreation use areas.
- Further deteriorate cultural resources sites.
- Produce conspicuous visual impacts. Juniper reduction in Class II Visual Resource Management (VRM) areas east of Eagle Lake would noticeably alter the color, line, and textural features of the landscape. The proposed brush control west of Highway 139 on Walsh Mountain is also in a Class II area and would create conspicuous short term visual impacts. These projects would conflict with visual resource management policy which states that for Class II areas, changes can occur in the landscape, but should not attract attention. Despite adherence to Standard Operating Procedures and mitigation, a high visual contrast would still result from the extensive juniper reduction.
- Further increase erosion through increased soil compaction and reduced shoreline cover.
- Further decrease water quality. Eagle Lake would experience increased littoral muck disturbance, pathogen input, sediment, and nutrient delivery. The range management portion of the water resources Best Management Practices for Eagle Lake would not be met.

Issue 4 - Protection of Willow Creek Values

Increased livestock grazing within the Willow Creek Canyon, without protective measures, would further degrade the canyon's environmental, recreational, visual, and cultural resources. Specific impacts would include:

- Significant increase in soil compaction, stream bank deterioration, and unprotected soil.
- Increased sedimentation and waterborne pathogens, slight decrease in stream temperatures during high sediment discharge periods, and more frequent periods where water quality is not suitable for contact recreation. Range management portion of the Best Management Practices for water resources would not be met for Willow Creek.
- Further degradation of fisheries and riparian habitat through destruction of stream bank vegetation with no reproduction of cover species, increased erosion, and near lethal water temperatures for fisheries.
- Accelerated destruction of cultural resource sites from livestock trampling and increased erosion.
- Reduced attractiveness for fishing, hiking, hunting, and sightseeing.
- Lowering of scenic values within the canyon.

Issue 5 - Range Condition and Production

As under the Proposed Action, intensive management, additional land treatments, and improved livestock distribution would, on the whole, improve and maintain range condition and production.

General Impacts:

Over 20 years, the following changes would be expected (TABLE 4-3):

- Sparse woodland canopy class would decline, resulting in a 45 percent decrease from 18,613 acres to 10,326 acres.
- Medium woodland canopy class would increase, resulting in a 17 percent increase from 1,115 acres to 1,301 acres.
- Poor condition range would improve, resulting in a 15 percent decrease from 60,140 acres to 51,156 acres.
- Fair condition range would improve, resulting in a 1 percent decrease from 161,194 acres to 159,143 acres.
- 1 percent increase in suitable rangeland (TABLE 2-7).
- 74 percent overall increase in good condition range.

Under the Increased Livestock Use Alternative, the vegetation composition, cover, and structure should remain stable with slight overall improvement in 20 years.

TABLE 4-3

Rangeland Condition, Woodland Canopy Class, and Production in 20 Years
Alternative C - Increased Livestock Use

ALLOTMENT	RANGELAND CONDITION[1/] (ACRES/PERCENT) Excellent and Good	Fair	Poor	WOODLAND CANOPY CLASS[1/] (ACRES/PERCENT) Dense	Medium	Sparse	BARREN LAND[1/] (Acres/Percent)	TOTAL[1/] (Acres)	PRODUCTION (AUMs)
Walton	0	461/50	0	197/21	27/3	245/26	0	930	73
Said Valley	164/11	1,208/78	138/9	0	0	0	35/2	1,545	203
Buffam-Metcalf	177/4	2,907/70	802/19	0	0	0	279/7	4,165	274
Dry Valley	9/2	309/68	120/27	0	0	0	15/3	453	53
New Bailey Creek	2,816/18	10,894/69	386/3	76/<1	0	0	1,397/9	16,569	2,231
Williams	550/18	2,200/2	1/<1	3/<1	28/1	94/3	182/6	3,058	715
New Ravendale	5,224/16	23,544/73	763/2	0	0	727/2	2,219/8	32,477	4,148
Crest	72/1	4,223/36	6,087/51	0	0	425/4	1,028/8	11,835	908
North Horse Lake	6,899/26	15,841/59	211/1	1,641/6	278/1	938/3	1,066/4	26,874	4,115
Slate Creek	4,680/17	15,794/57	1,011/4	1,961/7	239/1	2,501/10	1,344/4	27,529	2,998
Bucks Bay	1,327/25	2,394/46	75/1	677/13	62/1	557/11	62/1	5,154	728
Hansen	11/1	729/58	387/31	0	0	31/1	105/9	1,263	160
Snowstorm	8,715/20	20,480/47	8,799/20	0	0	3/<1	5,684/12	43,681	5,616
Erick	158/6	1,649/67	518/21	0	0	0	150/6	2,475	203
Wood	450/21	1,718/78	0	0	12/1	0	9/<1	2,189	396
Cottonwood	319/19	1,274/75	0	0	0	49/3	50/3	1,692	259
Stone	2/1	524/60	0	0	33/4	295/33	28/3	882	82
Walsh Mountain	763/16	1,292/26	240/5	125/3	481/10	1,518/32	361/8	4,780	353
Barron	96/2	3,062/70	248/6	78/2	12/1	95/2	718/17	4,309	147
South Horse Lake	5,318/13	28,257/68	3,813/9	165/<1	0	1,506/4	2,610/6	41,669	4,552
Humphrey 3-C	5/1	546/10	4,328/84	0	0	0	217/4	5,096	386
Tablelands	18/1	1,844/11	13,349/82	0	0	0	1,049/7	16,260	1,765
Coffin	223/21	197/18	0	35/3	35/3	490/47	82/8	1,062	77
Rice Canyon	957/9	6,119/57	2,377/22	0	49/<1	443/4	855/8	10,800	685
Johnson-Chappuis	34/<1	2,422/36	2,917/43	326/5	45/<1	409/6	615/8	6,768	298
Shaffer	6,761/28	9,256/38	4,586/19	0	0	0	3,830/15	24,463	1,448
TOTALS	45,778/15	159,143/54	51,156/17	5,284/2	1,301/<1	10,326/3	23,990/8	296,978	32,873
CHANGE FROM PRESENT	+74%	-1%	-15%	+1%	+17%	-45%	0		+46%

1/ Rangeland + Woodland + Barren Land = Total Land

Impacts on vegetation types and the effects of additional range improvements would be similar as for the Proposed Action. Range condition would improve due to:

- Increased livestock distribution.
- Development of intensive grazing plans (AMPs).
- Large scale vegetation treatments.
- Improved utilization patterns.
- Increased suitable rangeland.

Total of 275 acres disturbed in short term by range developments:

- 90 acres by fences.
- 185 acres by water developments and cattleguards.

As range condition improved over the next 20 years, production would increase by 46 percent from 22,522 AUMs to 32,873 AUMs as shown in TABLE 4-3.

Specific Impacts by Allotment:

The following allotments will not change significantly in 20 years under the Increased Livestock Use Alternative:

Walton	Coffin	Crest
Said Valley	Bucks Bay	Walsh Mountain
Buffham-Metcalf	Erick	Johnston-Chappuis
Dry Valley	Humphrey 3C	Shaffer
Hansen	Rice Canyon	Barron
Stone		

New Bailey Creek, New Ravendale, and Tablelands Allotments: Same specific impacts as those discussed under the Proposed Action.

North Horse Lake: Same impacts as for Proposed Action except for a 55 percent increase in production, rather than a 32 percent increase, due to an additional proposed 4,200 acre seeding.

Williams: The proposed 1,200 acre brush control and 2,500 acre juniper control would increase production by 36 percent and improve range condition.

Slate Creek: Same impacts as for Proposed Action except for a 64 percent increase in production, rather than 16 percent, due to an additional 7,000 acre juniper and brush reduction program.

Snowstorm: Same impacts as for Proposed Action except for a 48 percent increase in production, rather than 23 percent, due to an additional 8,000 acre brush control program.

Cottonwood and Wood Allotments: Widespread brush control on 1,600 and 2,200 acres would produce a respective 82 percent and 71 percent increase in production.

South Horse Lake: The proposed range improvements, including 5,500 acres of brush control and 2,500 acres of noxious weed control, would improve overall range condition and produce a 44 percent increase in production.

Non Issue Related Impacts

Soil: Areas of heavy livestock concentrations would experience increased compaction and erosion and decreased cover. Where livestock distribution is improved through range developments, there would be a slight improvement in the above factors while the vegetation manipulation areas would experience significant long term improvement in cover and reduced erosion. Soil values in semiwet meadows would experience continued degradation through decreased water-holding capacity and lowered water table. The soil erosion problem in Rice Canyon would continue.

Water Resources: There would be no significant change in water available for use, although the 61 proposed reservoirs would extend available water later into the summer. Water consumption by livestock would increase slightly. Water quality would decrease slightly overall, although beneficial uses would not be affected.

Threatened and Endangered Plants: Same as for Proposed Action.

Livestock Performance: Basically same as for Proposed Action with slight improvement due to development of seedings and vegetation manipulation providing an increase in forage production.

Wild Horses: Basically same as for Proposed Action.

Recreation: Probable slight decrease in hunting opportunities for deer, pronghorn, sage grouse, and quail. Slight increase in hunting opportunities for chukar. Impacts on off highway vehicle use same as for Proposed Action.

Visual Resources: Although proposed land treatments could create distinct visual contrasts with existing vegetation features, most of these areas are within Class IV Visual Resource Management areas which allow major visual changes.

Wilderness: The suitability of the Tunnison Mountain WSA for preservation as wilderness would be jeopardized under this alternative. Although most of the proposed new range developments would meet nonimpairment criteria (as identified in the Proposed Action), the proposed seeding would violate nonimpairment criteria. Increased livestock use along Willow Creek with no protective measures would degrade existing wilderness values (i.e., scenic, cultural resource, wildlife, etc.). Consequently, this alternative would not be allowable under Wilderness Management Policy if the area were designated as wilderness.

Cultural Resources: Substantial overall increase in livestock use, particularly in the Bucks Bay, Coffin, Walton, and Said Valley Allotments, would accelerate destruction of cultural resource sites through trampling, site displacement, and erosion of sites. Land treatments, if they involve surface disturbing methods on or near cultural sites, would have particularly severe impacts. Standard Operating Procedures would ensure consideration of cultural values in the project planning of range developments. Decreasing livestock use in the Dry Valley, Crest, and Stone Allotments would slightly lessen damage to cultural sites within those allotments.

Alternative D - No Action

Issue 1 - Wildlife-Livestock Conflicts

The No Action Alternative would result in a slow overall decline in wildlife habitat condition.

Mule Deer: The following impacts on mule deer would be expected:

- General decline in habitat condition.
- Continued forage competition for preferred browse species and spring forbs and grasses.
- Fluctuation in populations with probable gradual decline. Failure to attain objective numbers.

Pronghorn: The following impacts on pronghorn would be expected:

- Maintenance of or slight decline in habitat condition.
- Continued competition for spring forbs and preferred browse species.
- Fluctuation in populations with possible slight increases. Failure to attain objective numbers.

Sage Grouse: Decrease in numbers as condition of semiwet meadows slowly declines.

Other Game Birds: Maintenance of existing chukar populations due to their adaptability to poor range conditions. Water availability would continue to be the major limiting factor. Fluctuation in quail populations with slight decline as riparian habitat declines. Mourning dove populations would remain below potential due to limited forb production and associated seed source. Waterfowl production would remain below potential due to reduced cover adjacent to wetland areas.

Threatened and Endangered Animals: Bald Eagle habitat would not be significantly affected.

Fisheries: The fishery resources in Willow Creek would remain below potential due to reduced stream bank cover and high summer water temperatures.

Special Habitat Types: Continued degradation of all special habitat types, as discussed under Affected Environment.

Issue 2 - Social and Economic Conditions

Livestock Industry:

Cattle Sales: No change.

No change in total forage allocated to livestock.

Recreation-Based Employment:

No change.

Livestock Operators:

The following impacts on the Willow Creek livestock operators would be expected:

	Size of Ranch Operation		
	Part-Time/ Small	Medium	Large
Number of Operators	7	7	8
Number of Operators Substantially Affected (Threshold: 10% of total annual forage supply lost or gained)			
- Short Term	0	0	0
- Long Term	3 (lost)	1 (lost)	1 (gain)
AUM Allocation to Livestock			
5 Years (Short Term)	2,203	3,777	17,277
20 Years (Long Term)	1,709	3,561	17,972

Issue 3 - Management of Eagle Lake Basin

Continued adverse impacts on recreation, cultural, and scenic resources from livestock wandering, grazing of near shore tules and shoreline vegetation, and other associated impacts along popular shoreline use areas west of Highway 139 and on Rocky Point. Area would still meet current VRM class guidelines. Soil and water quality would not change from the current situation.

Issue 4 - Protection of Willow Creek Values

Continued livestock grazing along Willow Creek would:

- Further degrade the stream bank cover, reducing bank stability, increasing erosion, lowering the productivity of soil as a growing medium, and preventing the reproduction of cover species.
- Further degrade water quality due to increased temperature, sediment, and waterborne pathogens, and decreased dissolved oxygen.
- Approach or surpass lethal temperatures for brown trout survival (due to lack of stream shading) with subsequent deterioration of stream fishing potential.
- Continued subsurface and surface site displacement, artifact breakage, and increased erosion of numerous cultural resource sites, including at least two potential National Register Sites.
- Lowering of scenic values within canyon.

Issue 5 - Range Condition and Production

Under the No Action Alternative, the following items would not change significantly:

- Species composition and vegetation structure.
- Ground cover and litter accumulation.
- Livestock distribution and utilization.
- Suitable rangeland (TABLE 2-10).

General Impacts:

Lack of rest during the critical spring growing season under this alternative would result in:

- Poor plant vigor.
- Poor seedling establishment.
- Lack of litter accumulation.
- Poor utilization and distribution patterns.

Range condition would not change significantly under this alternative (TABLE 4-4). Poor condition range would remain poor, low-fair condition may decline to poor condition while high-fair and good condition range would not change in any significant amount. Woodland canopy would increase.

No significant change in production on majority of allotments (TABLE 4-4).

Specific Impacts by Allotment:

The majority of allotments would not change appreciably. There would, however, be a decrease in production and range condition that would occur on the New Bailey Creek and Johnston-Chappuis Allotments with existing management practices. There would be a small decrease in production of key perennial grasses in low vigor and low reproductive potential on poor and fair condition ranges.

TABLE 4-4

Rangeland Condition, Woodland Canopy Class, and Production in 20 Years
Alternative D - No Action

ALLOTMENT	RANGELAND CONDITION[1/] (ACRES/PERCENT) Excellent and Good	Fair	Poor	WOODLAND CANOPY CLASS[1/] (ACRES/PERCENT) Dense	Medium	Sparse	BARREN LAND[1/] (Acres/Percent)	TOTAL[1/] (Acres)	PRODUCTION (AUMs)
Walton	0	461/50	0	197/21	27/3	245/26	0	930	73
Said Valley	164/11	1,208/78	138/9	0	0	0	35/2	1,545	203
Buffam-Metcalf	177/4	2,849/68	860/21	0	0	0	279/7	4,165	274
Dry Valley	9/2	300/66	129/29	0	0	0	15/3	453	53
New Bailey Creek	974/6	12,305/74	1,033/6	76/<1	162/1	622/4	1,397/8	15,569	1,679
Williams	0	2,750/90	1/<1	3/<1	28/1	94/3	182/6	3,058	457
New Ravendale	95/<1	21,748/65	8,377/25	0	0	808/2	2,505/8	33,533	2,835
North Horse Lake	2,191/8	18,815/70	1,319/5	1,684/6	391/2	1,408/5	1,066/4	26,874	2,659
Slate Creek	2,033/8	13,303/50	1,394/5	2,091/8	734/2	5,630/22	1,344/5	26,529	1,826
Bucks Bay	1,224/24	2,489/48	83/2	677/13	62/1	557/11	62/1	5,154	728
Hansen	11/1	719/57	387/32	0	0	31/2	105/8	1,263	160
Shumway	41/<1	5,046/48	1,549/15	32/<1	292/3	2,919/27	728/7	10,607	862
Clark	0	70/41	81/47	0	0	7/4	14/8	172	25
Snowstorm	5,986/14	20,722/47	11,286/26	0	0	3/<1	5,684/12	43,681	3,785
Erick	158/6	1,649/67	518/21	0	0	0	150/6	2,475	203
Wood	21/1	2,060/94	87/4	0	12/<1	0	9/<1	2,189	232
Cottonwood	0	1,577/93	16/<1	0	0	49/3	50/3	1,692	142
Stone	2/<1	524/60	0	0	33/4	295/33	28/3	882	82
Walsh Mountain	440/9	1,587/33	269/5	245/5	513/11	1,365/29	361/8	4,780	283
Barron	96/2	3,062/70	248/6	78/2	12/<1	95/2	718/17	4,309	134
South Horse Lake	3,655/9	28,443/68	5,288/13	175/<1	141/<1	1,357/3	2,610/6	41,669	3,166
Humphrey 3-C	5/<1	719/14	4,155/81	0	0	0	217/4	5,096	386
Tablelands	18/<1	369/2	14,824/91	0	0	0	1,049/6	16,260	714
Coffin	223/21	194/18	2/<1	35/3	36/3	490/47	82/8	1,062	77
Rice Canyon	1,057/10	5,899/55	2,497/23	0	49/<1	443/4	855/8	10,800	685
Johnson-Chappuis	34/<1	2,223/33	3,122/46	326/5	45/1	403/6	615/9	6,768	271
Shaffer	8,066/33	7,981/33	4,586/19	0	0	0	3,830/15	24,463	1,448
TOTALS	26,680/9	159,072/54	62,259/21	5,619/2	2,537/<1	16,821/6	23,990/8	296,978	23,242
CHANGE FROM PRESENT	0	-1%	+4%	+7%	+128%	-9%	0		0

1/ Rangeland + Woodland + Barren Land = Total Land

Non Issue Related Impacts

Soil: Continued soil compaction, lowering productivity of soil as a growing medium, accelerated erosion, and streambank deterioration. Soil land use goal would not be met without major watershed restoration program.

Water Resources: Slight increase in runoff due to soil compaction in areas of concentrated livestock use. Continued water quality degradation (high temperature, sediment and waterborne pathogens, and reduced dissolved oxygen) where cattle concentrate along riparian areas. Improvement in other areas due to past improvements in range management practices. Water quality land use goal would not be met due to continued degradation of meadows. Best Management Practices for the protection of water quality would not be met.

Threatened and Endangered Plants: No significant impacts.

Livestock Performance: Would not be expected to change with existing management practices.

Wild Horses: Continuation of present management would not affect the wild horse population.

Recreation: Probable slight decrease in hunting opportunities for deer. Probable slight increase in pronghorn hunting opportunities. Slight decrease in sage grouse and quail hunting opportunities. No change in chukar hunting opportunities.

Visual Resource: Despite continued deterioration of shoreline and riparian areas, VRM class guidelines would still be met.

Wilderness: Wilderness values would remain mostly status quo except along Willow Creek where degradation of soil, vegetation condition, and water quality would continue. However, the WSA would still maintain its suitability for wilderness preservation.

Cultural Resources: Many of the estimated 1,720 cultural sites, including 10 potential National Register Districts or Sites, would continue to receive adverse impacts (i.e., subsurface and surface site displacement, artifact breakage, and increased erosion), particularly around reservoirs and streams and on low bench areas adjacent to most valley floors.

Alternative E - No Grazing

Issue 1 - Wildlife-Livestock Conflicts

Under the No Grazing Alternative, all present and potential conflicts would be eliminated. As range condition over much of the planning unit improved toward climax, those wildlife species which favor low successional stage plant communities would decline in population while populations of species favoring higher successional stages would increase over the long term.

Mule Deer: The following impacts on mule deer would be expected:

- Initial enhancement of habitat condition leading to an increase in deer populations toward objective numbers. This increase would place added pressure on preferred browse species. In many areas, the added pressure could result in habitat degradation because the competitive advantage would swing from the heavily utilized browse species to the lightly utilized perennial grass species. Elimination of livestock grazing would remove one means of maintaining subclimax successional stages which deer prefer. Consequently, over the long term, as the vegetation composition changed, mule deer populations would slowly decline.

Pronghorn: The following impacts on pronghorm would be expected:

- Increase in pronghorn population from 800 toward objective numbers (1,250 wintering animals) or to the carrying capacity of the range due to additional forage, especially perennial forbs.

Sage Grouse: Significant increase in Sage grouse populations due to an increase in forage and cover. Meadow vegetation would improve dramatically, providing many quality brood-rearing areas. However, over the long term, some meadows would become heavily vegetated with perennial grass species and sage grouse use would decline (Oakleaf, 1971). Vegetation manipulation would be required to sustain the increased sage grouse numbers.

Other Game Birds: Slight increase in quail and dove populations as well as resident waterfowl populations. Slight decrease in chukar populations as overall vegetation conditions improve.

Threatened and Endangered Animals: Possible very slight improvement in Bald Eagle habitat due to improved conditions along the Willow Creek corridor.

Fisheries: With decreased stream bank erosion and increased cover, water temperatures would decrease and fishery habitat would improve.

Special Habitat Types: The willow-riparian habitat type would improve significantly in the short term and would, over the long term, become reestablished into most of the areas it previously occupied. This would greatly benefit many wildlife species that depend on this habitat type for food, cover, and water.

The semiwet meadow habitat type would respond much the same as the willow-riparian habitat, with improved condition over the short term and reestablishment of previously occupied areas over the long term.

Bitterbrush and mahogany areas and aspen stands should slightly improve as livestock grazing pressure is eliminated. However, without livestock grazing, perennial grasses should increase and compete with shrubby species for available soil moisture, to the detriment of shrubby species.

Issue 2 - Social and Economic Conditions

While the elimination of livestock grazing in the Willow Creek Planning Unit would have adverse impacts on the livestock operators, the impacts on the regional economy and population levels would be less severe. This is because agriculture, including livestock grazing, provides less than two percent of the region's employment. Livestock reductions would result in a loss of less than one percent of the region's employment.

Livestock Industry:

Cattle sale losses:

- $326,000 due to elimination of all 23,257 AUMs of livestock use.
- 3 percent of regional meat sales.

Recreation-Based Employment:

Same as for Proposed Action.

Livestock Operators:

The following changes in profitability of representative 200/1,000 herd cattle operation in the planning unit would be expected:

	INCOME ABOVE CASH COSTS 2/	
Operator Response 1/	200 Head	1,000 Head
Reduce herd size	$13,600	$16,600
Rent pasture @ $10/AUM	$14,600	$19,500

1/ Compares with existing profitability of $17,000 and $28,600, respectively.

2/ Does not include costs such as mortgage payments, depreciation, and family labor.

The following impacts on the Willow Creek livestock operators would be expected:

	Size of Ranch Operation		
	Part-Time/ Small	Medium	Large
Number of Operators	7	7	8
Number of Operators Substantially Affected (Threshold: 10% of total forage supply lost)	7	4	3

Recently acquired ranches would be more vulnerable due to:

- Inflated ranch prices.
- Higher interest rates.

Trend toward ranch consolidation would be accelerated.

One large cattle operator would probably be unable to continue due to:

- 46% forage dependency on Willow Creek public lands.
- Difficulty of utilizing adjacent private lands.

Four small cattle operators would probably be unable to continue due to:

- 36% to 54% dependency for Willow Creek forage.

Issue 3 - Management of Eagle Lake Basin

- Improvement in recreational enjoyment of Eagle Lake shoreline areas by eliminating livestock wandering, grazing pressure on shoreline plants and near shore aquatic plants, and other associated impacts.
- Elimination of trampling of cultural sites by livestock.
- Improvement in scenic quality of basin.
- Improvement in water quality and soil stabilization.

Issue 4 - Protection of Willow Creek Values

- Increase in streambank vegetation toward the potential plant community.
- Decrease in erosion and soil compaction.
- Increase in water quality (decreased temperature by approximately 1°C; decreased sediment; decreased waterborne pathogens, i.e., a decrease in indicator (fecal coliform) bacteria from more than 150/100 ml to less than 10/100 ml; and increased dissolved oxygen to near saturation).
- Increase in stream shading and cover with resulting enhancement of trout populations.
- Elimination of trampling of cultural sites by livestock.
- Improved scenic quality and attractiveness for fishing, hiking, swimming, and sightseeing.

Issue 5 - Range Condition and Production

Under the No Grazing Alternative, the following would occur in 20 years:

- Shift from less desirable invader and increaser plants to decreasers on species representing a climax plant community.
- Species composition and vegetation structure would improve.
- Increase in ground cover and litter accumulation.
- Due to past grazing, some vegetation types may not reach their potential (Robertson and Pearse, 1945; Stebbins, 1965; Young, Evans, and Tueller, 1976).
- Increase in vegetation diversity.

General Impacts:

On most allotments:

- Low-fair range would improve to high-fair condition.
- High-poor range would improve to fair condition.
- Fair range would improve to good condition faster than poor range would improve to fair (McLean and Tisdale, 1972).

Some vegetation types would not significantly improve due to:

- Very shallow stony clay soil.
- Low precipitation.
- Competition with invader species (native and exotics).
- Low plant vigor.
- Insufficient seed source (McLean and Tisdale, 1972).

TABLE 4-5 shows range condition and production in 20 years under the No Grazing Alternative.

Non Issue Related Impacts

Soil: Livestock impacts (soil compaction, reduction in organic matter, and deterioration of root structure) would diminish. However, some areas have reached such a high point of deterioration from decades of continuous impacts that they would not recover without artificial assistance. Degraded meadows which exhibit gullies and headcutting are of primary concern.

Water Resources: No significant change in water quantity available for use. Overall improvement in water quality from removal of livestock and subsequent revegetation of riparian areas. This alternative would probably meet the water quality objective, although it would not meet the Best Management Practices for water quality alone due to socioeconomic impacts.

Threatened and Endangered Plants: No immediate impacts. Possible long term slight decrease in *Lomatium ravenii* density due to increased competition from perennial grasses.

TABLE 4-5

Rangeland Condition, Woodland Canopy Class, and Production in 20 Years
Alternative E - No Grazing

ALLOTMENT	RANGELAND CONDITION[1/] (ACRES/PERCENT) Excellent and Good	Fair	Poor	WOODLAND CANOPY CLASS[1/] (ACRES/PERCENT) Dense	Medium	Sparse	BARREN LAND[1/] (Acres/Percent)	TOTAL[1/] (Acres)	PRODUCTION (AUMs)
Walton	141/15	323/34	0	197/22	27/2	245/27	0	930	89
Said Valley	422/27	950/62	138/9	0	0	0	35/2	1,545	227
Buffam-Metcalf	750/18	2,334/56	802/19	0	0	0	279/7	4,165	312
Dry Valley	88/19	230/51	120/27	0	0	0	15/3	453	63
New Bailey Creek	3,800/23	9,977/60	515/2	159/1	104/2	617/4	1,397/8	16,569	1,716
Williams	743/24	2,007/66	1/<1	3/<1	28/<1	94/3	182/6	3,058	626
New Ravendale	5,280/16	16,654/50	8,287/24	0	81/<1	726/2	2,505/8	33,533	3,289
North Horse Lake	6,527/24	14,636/55	1,162/4	1,684/6	391/2	1,408/5	1,066/4	26,874	3,271
Slate Creek	4,178/16	11,559/44	995/4	2,091/8	734/2	5,628/21	1,344/5	26,529	2,082
Bucks Bay	1,524/30	2,248/44	24/<1	677/13	62/1	557/11	62/1	5,154	837
Hansen	120/9	653/52	354/29	0	0	31/2	105/8	1,263	198
Shumway	1,027/10	4,236/40	1,444/13	19/1	234/2	2,919/27	728/7	10,607	1,000
Clark	19/11	56/33	76/44	0	0	7/4	14/8	172	30
Snowstorm	9,823/22	17,497/40	10,674/24	0	0	3/<1	5,684/12	43,681	4,201
Erick	546/22	1,301/53	478/19	0	0	0	150/6	2,475	244
Wood	383/17	1,713/78	72/3	0	12/1	0	9/1	2,189	269
Cottonwood	302/18	1,291/76	0	0	0	49/3	50/3	1,692	163
Stone	327/37	200/23	0	0	33/4	294/33	28/3	882	97
Walsh Mountain	708/15	1,356/27	232/5	171/4	513/11	1,439/30	361/8	4,780	314
Barron	740/17	2,437/56	229/5	78/2	12/1	95/2	718/17	4,309	166
South Horse Lake	6,605/16	26,546/64	4,237/10	175/<1	141/<1	1,355/3	2,610/6	41,669	3,894
Humphrey 3-C	110/2	791/16	3,978/78	0	0	0	217/4	5,096	513
Tablelands	99/1	340/2	14,772/91	0	0	0	1,049/6	16,260	735
Coffin	251/24	169/16	0	35/3	35/3	490/46	82/8	1,062	79
Rice Canyon	2,645/24	4,431/41	2,377/22	27/<1	49/<1	416/4	855/8	10,800	815
Johnson-Chappuis	741/11	1,641/24	2,992/44	326/5	44/1	409/6	615/9	6,768	322
Shaffer	10,037/41	6,126/25	4,470/17	0	0	0	3,830/15	24,463	1,636
TOTALS	57,936/19	131,702/44	58,429/20	5,642/2	2,497/1	16,782/6	23,990/8	296,978	27,188
CHANGE FROM PRESENT	+117%	-18%	-3%	+8%	+124%	-10%	0		+17%

1/ Rangeland + Woodland + Barren Land = Total Land

Wild Horses: No significant impacts.

Recreation: Hunting opportunities for deer would initially increase then gradually decline. Hunter days would fluctuate above then below current levels. As pronghorn populations increase to objective numbers, hunting opportunities would increase up to 56 percent above present levels. Hunting opportunities for sage grouse would increase significantly. Quail and dove hunting would increase slightly while chukar hunting would decrease slightly.

Visual Resources: Enhancement of scenic quality with improved vegetation conditions.

Wilderness: Wilderness suitability preserved with overall positive impacts on wilderness values due to the removal of most of man's influences. Maintenance of some water developments would continue to have minor negative impacts on naturalness and solitude.

Cultural Resources: The No Grazing Alternative would benefit cultural resources because all trampling of sites by livestock would be eliminated and the restored vegetation cover would retard erosion.

MITIGATION MEASURES

The following mitigation measures are intended to help reduce or eliminate adverse impacts identified in this chapter. These include specific measures in addition to those already described under Standard Operating Procedures, page 2-25. All mitigation measures pertaining to the selected alternative will be considered.

1. Turnout dates and dates for moving livestock from one pasture to another will be synchonized with range readiness and the phenological development of the key plant species in AMP Allotments (Alternatives A, B, and C). These dates can vary from year to year due to fluctuations in the conditions that affect plant phenology. Yearly monitoring of plant phenological stages will be necessary for proper adjustment of dates for turnout and pasture moves.

   This mitigation measure will give the land manager a certain amount of flexibility in determining turnout dates based on annual phenological differences. This will help protect plant vigor and range condition in years when plant development is late.

2. Livestock turnout areas will be rotated from year to year in AMP Allotments.

   This mitigation measure will prevent persistently heavy livestock concentration in specific areas, thus enhancing the distribution and utilization of preferred forbs and browse species.

3. Salt or mineral blocks and spring developments will be located and designed to encourage livestock use away from spring meadows (Alternatives A, B, and C). Where monitoring shows that livestock grazing continues to degrade meadow values, fencing and/or rehabilitation will be considered.

   Spring meadows provide important wildlife habitat and contain watershed values easily disturbed by excessive concentrations of livestock. This mitigation measure will minimize livestock trampling and vegetation destruction within these spring meadows and ensure further protection, if needed.

4. Areas supporting Lomatium ravenii will not be sprayed with broadleaf eradicating herbicides during spring and summer months.

   Lomatium ravenii, listed as endangered by the State of California, is a broadleaf plant which would be destroyed if spraying occurred during spring and summer.

5. For all proposed seedings (Alternatives A and B), suitable perennial forbs, grasses, and browse will be included in the seed mixture and about 20 percent of the total area treated will be left in native vegetation to provide interspersion within the seeded area.

   These measures will reduce the loss of pronghorn spring forage caused by seedings, maintain habitat diversity, and prevent the displacement of wildlife.

6. Walkovers will be installed where fences would restrict regular pedestrian traffic, and cattleguards or gates will be installed where fences cross existing vehicle travel routes (Alternatives A, B, and C).

   The Willow Creek Planning Unit is a popular recreation use area by hunters, visitors to Eagle Lake and Willow Creek, and other dispersed users. This mitigation measure would minimize impediment to free travel within this popular region.

UNAVOIDABLE ADVERSE IMPACTS

Alternative A - Proposed Action

- Continued suppression of riparian and meadow habitat where not fenced.
- 268.5 acres of soil and vegetation disturbed by range improvements.
- 76,200 acres of soil and vegetation disturbed by land treatments.
- Moderate but allowable impacts on wilderness quality.
- Continued moderate degradation of cultural resources.

Alternative B - Decreased Livestock Use

- Continued suppression of riparian and meadow habitat where not fenced.
- Loss of $112,000 in annual sales of meat in region.
- 177.5 acres of soil and vegetation disturbed by range improvements.
- 41,300 acres of soil and vegetation disturbed by land treatments.
- Minor but allowable impacts on wilderness quality.
- Continued but decreased degradation of cultural resources.

Alternative C - Increased Livestock Use

- Decline in wildlife habitat condition and populations.
- Continued deterioration of riparian and meadow habitat.
- Continued livestock-recreation conflicts along Eagle Lake shoreline.
- Decreased soil condition in areas of heavy livestock concentration.
- Decreased water quality in Eagle Lake and Willow Creek.
- 275 acres of soil and vegetation disturbed by range improvements.
- 105,800 acres of soil and vegetation disturbed by land treatments.
- Conspicuous visual change in juniper removal areas in Eagle Lake Basin.
- Significant impacts on wilderness quality.
- Accelerated degradation of cultural resources.

Alternative D - No Action

- Slow decline in wildlife habitat condition and populations.
- Continued deterioration of riparian and meadow habitat.
- Continued livestock-recreation conflicts along Eagle Lake shoreline.
- Continued suppression of range condition and production.
- Continued deterioration of soil conditions.
- Continued water quality degradation.
- Minor but allowable impacts on wilderness quality.
- Continued degradation of cultural resources.

Alternative E - No Grazing

- Loss of $326,000 in annual sales of meat in the region.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

This section identifies the trade-offs between short- and long-term productivity of the resources involved in the five alternatives. "Short term" refers to the period of project implementation within about 5 years and "long term" refers to the period 20 years or beyond.

In the short term, soil loss would increase slightly under Alternatives A, B, and C in areas of range improvement construction and land treatments. In the long term, increased vegetation production and ground cover would reduce soil loss, thus providing improvement in the soil resource.

For Alternatives A, B, and C, in the short term, there would be about 268.5, 177.5, and 275 acres, respectively, of vegetation disturbed by range improvements and 76,200, 41,300, and 105,800 acres, respectively, disturbed by land treatments. In the long term, range condition and production would increase significantly.

In the short term, Alternative E would allow improvement in deer, pronghorn, and sage grouse habitat condition and hunting opportunities. In the long term, the habitat condition and hunting opportunities would decline as plant communities moved toward climax.

Visual resources would be adversely impacted in the short term by range improvements and land treatments (Alternatives A, B, and C). In the long term, impacts to visual resources would be lessened by increased vegetation growth.

Degradation of cultural resources would continue under Alternatives A, B, and C in the short term. In the long term, there would be more stabilization of cultural resource sites due to decreased erosion.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

This section identifies the extent to which the five alternatives would irreversibly limit potential uses of the land and resources. Irreversible and irretrievable commitments of resources occur when a wide range of future options is foreclosed.

Minor soil loss would be irretrievably committed in areas of range improvement construction and land treatments under Alternatives A, B, and C. Under Alternatives C and D, streambanks, meadows, and other sensitive areas left unprotected would experience minor soil losses.

In areas of range improvements and land treatments, land and vegetation would be committed for the lives of the projects (Alternatives A, B, and C).

All negative impacts on cultural resources would result in irretrievable losses of information (Alternatives A, B, C, and D).

Under Alternatives B and E, $112,000 and $326,000, respectively, would be lost in annual meat sales in the region.

Chapter 5

Consultation & Coordination

Chapter 5

CONSULTATION AND COORDINATION WITH OTHERS

PUBLIC INVOLVEMENT

Consultation and coordination with the public and public agencies was a planned and integral part of the development of the management alternatives analyzed in this Draft EIS.

Following is a summary of the consultation, coordination, and public participation in the EIS process:

- Preplanning analysis completed and distributed for public review and comment in January, 1980.

- Notice of Intent to revise land use plan published in Federal Register and filed with California State Clearinghouse on November 21, 1980.

- "Target Group Analysis Chart" prepared in May, 1980, to guide staff consultation with public.

- Field tour conducted on May 28, 1980, to explain inventory process to livestock permittees and other interested publics.

- News stories placed in local newspapers on an on-going basis to explain inventory and planning process.

- Area Manager and his staff contacted livestock permittees, interest groups, and other government agencies during development of land use plan recommendations.

- Notice of Intent to prepare EIS and conduct scoping meetings published in Federal Register and filed with California State Clearinghouse on May 22, 1981.

- On June 24, 1981, two public meetings were held in Susanville to obtain public input on the land use plan recommendations, scope the issues to be addressed in the EIS, and finalize the alternatives to be analyzed in the EIS.

Oral comments from the public meetings, as well as written comments received, were used in the final development of alternatives analyzed in this Draft EIS. These comments, and all other public inputs, are on file and available for public review in the BLM Susanville District Office.

After public review, the comments received on this Draft EIS will be addressed in the preparation of the Final EIS.

The District Manager then has the responsibility of preparing proposed grazing decisions from the Final EIS and additional comments received. These proposed decisions will be subject to public review and consultation before final decisions are made and implementation is begun.

LIST OF AGENCIES AND ORGANIZATIONS TO WHOM COPIES OF THE EIS WERE SENT

In addition to interested individuals, comments on the Draft EIS were requested from the following agencies and interest groups:

FEDERAL

Environmental Protection Agency
Advisory Council on Historic Preservation
U. S. Department of the Interior
- Bureau of Mines
- National Park Service
- Water and Power Resources Services
- Geological Survey
- Fish and Wildlife Service

U. S. Department of Agriculture
- Forest Service
- Soil Conservation Service

CALIFORNIA - STATE AGENCIES

Office of the Governor
Office of Planning and Research
State Historic Preservation Office
Native American Heritage Commission
Resources Agency
- Department of Water Resources
- Air Resources Board
- Division of Mines and Geology
- Division of Oil and Gas
- Department of Fish and Game
- Department of Parks and Recreation
- Department of Forestry

CALIFORNIA - LOCAL AGENCIES

Lassen County Board of Supervisors
Lassen County Farm Advisor (Extension Service)
Lassen County Fish and Game, and Recreation Commission
Lassen County Agricultural Commission
Lassen County Planning Commission
Honey Lake Valley Resource Conservation District

OTHER ORGANIZATIONS

Natural Resources Defense Council, Inc.
California Native Plant Society
California Conservation Council
North Cal-Neva RC&D
Public Lands Committee
California Natural Resource Federation
Northern California Planning Council
Friends of Eagle Lake
American National Cattlemen's Association
California Cattlemen's Association
Lassen County Cattlemen's Association
California Woolgrower's Association
Society for Range Management
Native American Heritage Advisory Committee
Sierra Club
Sierra Club - Reno
Northern California Wilderness Coalition
Lassen County Mineral and Gem Society
Wild Horse Organized Assistance, Inc.
International Society for Protection of Mustangs and Burros
Eagle Lake Sailing Association
California Association of 4-WD Clubs, Inc.
California Off-Road Vehicle Association
Lassen Motorcycle Club
Hot Wheels 4 X 4 Club
Glass Mountain Four-Wheelers
Lassen Organized Sportsmen
Lassen Fin and Antler Club
National Wildlife Federation
California Wildlife Federation

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GLOSSARY

ABBREVIATIONS

AMP	allotment management plan
AUM	animal unit month
BLM	Bureau of Land Management
CFR	Code of Federal Regulations
EA	environmental assessment
EIS	environmental impact statement
FLPMA	Federal Land Policy and Management Act
HMP	habitat management plan
IMP	interim management policy
MFP	management framework plan
NRHP	National Register of Historic Places
OHV	off-highway vehicle
PAA	planning area analysis
SCS	Soil Conservation Service
SVIM	soil vegetation inventory method
URA	unit resource analysis
VRM	visual resource management
WSA	wilderness study area

TERMS

ACTUAL USE: The amount of livestock use actually grazed.

ALLOTMENT: An area of land where one or more operators graze their livestock. It generally consists of public lands, but may include parcels of private or state owned lands. The number of livestock and period of use are stipulated for each allotment. An allotment may consist of several pastures or be only one pasture.

ALLOTMENT MANAGEMENT PLAN (AMP): A livestock grazing management plan dealing with a specific unit of rangeland, and based on multiple-use resource management objectives. The AMP considers livestock grazing in relation to other uses of the range and in relation to renewable resources - watershed, vegetation, and wildlife. An AMP establishes the seasons of use, the number of livestock to be permitted on the range, the range improvements needed, and the grazing system.

ANIMAL UNIT: The equivalent of one mature (1,000 lb.) cow or 5 sheep based upon average daily forage consumption of 26 lbs. dry matter per day.

ANIMAL UNIT MONTH (AUM): (1) The amount of feed or forage required by an animal unit for one month (i.e., 800 lbs./month). (2) Tenure of one animal-unit for a period of one month.

ANNUALS: Plants produced from seed which complete their life cycle in one growing season.

ARCHAEOLOGICAL RESOURCES: Sites, areas, structures, objects, or other evidence of prehistoric or historic human activities.

BARREN LAND: Areas having little or no vegetation, including playas, rock outcrops, rubble lands, and dumps.

BASE HERD: Constant herd size that is continually licensed.

BEST MANAGEMENT PRACTICE (BMP): A practice or combination of practices determined by the State and/or area-wide planning agencies, after problem assessment, examination of alternative practices, and appropriate public participation, to be the most effective, practicable means of preventing or reducing pollution generated by non-point sources to a level compatible with water quality standards.

BROWSE: The tender shoots, twigs, and leaves of trees and shrubs often used as food by cattle, deer, elk, and other animals; or to feed or eat on browse.

CALF CROP: The number of calves weaned from a given number of cows bred, usually expressed as a percentage.

CANOPY: The vertical projection downward of the aerial portion of shrubs and trees, usually expressed as percent of ground so occupied (Range Term Glossary Committee, 1974).

CARRYING CAPACITY: The maximum stocking rate possible without damaging vegetation or related resources. Carrying capacity may vary from year to year on the same area due to fluctuating forage production caused primarily by differing amounts of precipitation.

CATCHMENT: A structure built to collect and retain water.

CHANNEL EROSION: Erosion occurring in the bottom of gullies that are more than 1 foot deep.

CLIMAX: The highest ecological development of a plant community capable of perpetuation under the prevailing climate and soil conditions (Range Term Glossary Committee, 1974).

COMPETITIVE AUM: The cattle AUM equivalent of competitive forage requirements for other grazing animals.

COMPETITIVE FORAGE: Forage which is being utilized by more than one grazing animal at the same period of time or in the same areas.

COMPOSITION: The proportions of various plant species in relation to the total in a given area.

COW-CALF LIVESTOCK OPERATION: A livestock operation in which a base breeding herd of mother cows and bulls is maintained. The cows produce a calf crop each year, and the operation keeps some heifer calves from each calf crop for breeding.

CRITICAL WILDLIFE HABITAT: That portion of the living area of a wildlife species that is essential to the survival and perpetuation of the species either as individuals or as a population.

CULTURE AREAS: Geographical regions where a similarity of cultural forms of the occupants of a region are found through ethnographic and archaeological studies.

CULTURAL RESOURCES: Those fragile and nonrenewable remains of human activity, occupation, or endeavor, which are reflected in district sites, structures, buildings, objects, artifacts, ruins, works of art, architecture or natural features.

CUMULATIVE IMPACT (WILDERNESS): The aggregate impact of existing and proposed activities. Individual intrusions when considered by themselves may not impair wilderness suitability; however, when combined with other existing and proposed substantially unnoticeable impacts, the total effect may be sufficient to impair an area's suitability for preservation as wilderness.

DEBITAGE: In archaeology, the detritus of stoneworking activity.

DECREASERS: Plant species of the original or climax vegetation that will decrease in relative amount with continued overuse.

DEFERRED GRAZING: Withholding of livestock grazing until a certain stage of plant growth is reached, usually maturity of seed.

DEPENDENCY: The amount of forage provided by public lands, expressed as a percentage of a herd's total forage requirements for one complete year. The forage requirement is based on the ranch's total herd.

DISCLIMAX: An ecological community, normally stable under certain climatic conditions, that has been altered by man or other influence.

ENDANGERED SPECIES: Any species which is in danger of extinction throughout all or a significant portion of its range.

EPHEMERAL STREAM: A stream which only flows for a short time each year in direct response to precipitation events.

FORAGE: All browse and herbaceous foods that are available to grazing animals.

FORB: Non-woody herbaceous plants neither grass nor resembling grass.

GRANDFATHERED USE (WILDERNESS): An authorized use taking place on the land as of the date of FLPMA (October 21, 1976).

GRAZING PERMIT: A document authorizing use of the public lands for the purpose of grazing livestock.

GRAZING SYSTEM: A systematic sequence of grazing use and nonuse of an allotment.

GREAT BASIN: The region of interior drainage comprising most of Nevada as well as portions of Utah, California, Idaho, Wyoming, and Oregon.

GROUND COVER: The material covering the soil, including standing vegetation, which provides protection from, or resistance to, the impact of raindrops and the energy of overland flow, and expressed in percent of the area covered. Composed of vegetation, litter, erosion pavement, and rock.

HABITAT: The natural environment of a plant or animal.

HABITAT TYPE: The collective area occupied by one plant association, which is the product of all ecological factors (soil, climate, topography, etc.).

HERB: Any flowering plant except those developing persistent woody stems above ground.

HERBICIDE: A chemical substance used to kill or inhibit the growth of plants.

HUNTER DAY: Participation of one person in hunting for all or part of one day.

INCREASERS: Plant species of the original or climax vegetation that increase in relative amount, at least for a time, under overuse.

INDICATOR PLANTS: Plants that indicate or show the presence of certain environmental conditions.

INDIRECT INCOME: Net revenue to other sectors of the economy resulting from sales to ranching operations.

INTENSIVE MANAGEMENT: Management using range improvements and scientific techniques, including grazing systems, to maximize sustained yields of animals and forage production.

INTERIM MANAGEMENT POLICY: The Bureau's management policy for lands under wilderness review. The policy is to continue resource use on lands under wilderness review in a manner that maintains the area's suitability for preservation as wilderness (referred to as the "Nonimpairment" Standard).

INVADERS: Plant species that were absent or present in very small amounts in undisturbed portions of the original or climax vegetation and will invade under disturbance or continued overuse (Range Term Glossary Committee, 1974).

KEY FORAGE SPECIES: A plant which is relatively or potentially abundant, endures moderately close grazing, and serves as an indicator of changes occurring in the vegetational complex. This species is an important vegetation component which, if overused, will have a significant effect on watershed condition, grazing capacity, or other resource values.

LITHIC SCATTER: Stone debris left as the result of tool manufacture or reshaping.

LITTER: The uppermost layer of undecomposed, organic debris on or near the soil surface.

LITTORAL MUCK: A dark-colored soil along the lake shore zone which has a high percentage of decomposed or finely ground organic matter and is rich in nutrients.

LIVESTOCK GRAZING LICENSE: An authorization which permits the grazing of a specified number and class of livestock on a designated area of BLM grazing lands for a period of time.

LIVESTOCK OPERATION: An economic enterprise for the purpose of producing livestock.

LIVESTOCK OPERATOR: A person who grazes livestock on public lands.

MANAGEMENT FRAMEWORK PLAN (MFP): A land use plan for public lands which provides a set of goals, objectives, and constraints for a specific planning area to guide the development of detailed plants for the management of each resource.

NATIONAL REGISTER OF HISTORIC PLACES: The official list, established by the Historic Preservation Act of 1966, of the nation's cultural resources worthy of preservation.

NATIONAL REGISTER PROPERTY: A district, site, building, structure, or object included in the National Register.

NONCOMPETITIVE FORAGE: Forage utilized by only one type of grazing animal.

NONUSE (REGULAR): The authorization by permit to withhold livestock use on the range without loss of preference for future consideration in livestock use of public lands. Expressed in Animal Unit Months.

OPEN SITE: An archaeological site on open ground, that is most site categories except caves, rockshelters, and petroglyphs.

OVERSTORY: That portion of a plant community that is dominant as to height; the tallest plants on a given site.

PARTURITION: The action or process of giving birth to offspring.

PASTURE: A grazing area separated from other areas by a fence. As used in this document, a pasture is a subdivision of a grazing allotment.

PERENNIAL: A plant having a life cycle of three or more years.

PERMITTEE: Holder of a license or permit for grazing of livestock on an allotment.

PETROGLYPH: A figure, design, or indentation carved, abraded, or pecked on a rock.

PHENOLOGY: The study of the sequence of events and time of occurrence of the life processes of a plant such as start of growth, flowering, seed ripe, etc., especially as related to climate.

PLANT ASSOCIATION: A plant community of definite composition, presenting a uniform physiognomy and growing in uniform habitat conditions.

PLANT DENSITY: The number of individual plants per unit of area. Refers to the relative closeness of individual plants to one another (Range Term Glossary Committee, 1974).

PLANT SUCCESSION: The process of vegetational development whereby an area becomes successively occupied by different plant communities of higher ecological order.

PREFERENCE: Grazing privileges established following the passage of the Taylor Grazing Act, based on the use of the Federal range during the priority period. The active preference and suspended preference together make up the total grazing preference.

PRIVILEGE: Synonomous with preference.

PUBLIC LAND: Land administered by the Bureau of Land Management.

RANCH FUNDAMENTALISM: The persistence of a group of ranchers to continue in their given lifestyle despite the opportunities to sell their lands at a high price.

RANGE ADJUDICATION: The allocation of grazing allotments, seasons of use, and numbers and class of livestock to qualified operators.

RANGE CONDITION (ECOLOGICAL): The present state of the vegetation of a range site in relation to the climax (natural potential) plant community for that site. Measured as a percentage of the present plant community that is climax for the range site.

RANGE DEVELOPMENT: Any structure or excavation that facilitates management of range or livestock.

RANGELAND SUITABILITY: A measure of an area's ability to be used for livestock grazing using four major criteria (distance to water, degree of slope or other physical barriers, forage production, and watershed condition) which are evaluated independently or in various combinations to arrive at a suitability class.

RANGE SITE: A distinctive kind of rangeland that differs from other kinds of rangeland in its ability to produce a characteristic natural plant community.

RANGE TREND: The direction of change in range condition.

RANGE READINESS: The stage of growth of the important palatable plants on the range and condition of soil which permit grazing without undue compacting of the soil or endangering the ability of the plants to maintain themselves.

REMNANT SPECIES: Those plant species present in a deteriorated plant association that are representative of a climax plant association.

REST: Removal of grazing on a range area to allow plants to replenish their food reserves. Used in this document to refer to year-long relief from livestock grazing.

RETURN ABOVE CASH COST: Gross sales minus variable costs (feed, replacement bulls, etc.), and property taxes.

RIPARIAN: Situated on or pertaining to the bank of a river, stream, or other body of water. Normally used to refer to the plants of all types that grow rooted in the watertable of streams, ponds, and springs.

ROCKSHELTER: Any natural shelter between or under standing rocks in which traces of human activity are found.

SEASON OF USE: That period of time, as designated in planning documents, within which livestock grazing can be authorized.

SOCIOECONOMICS: Relating to or involving a combination of various social and economic factors.

SOIL COMPACTION: The process of increasing the bulk density of the soil through the compression of large voids. Reduction of the air spaces in the soil will result in overland flow of water and surface erosion occurring with less intense storms. Soil compaction can also significantly reduce plant vigor by reducing the gas exchange (CO_2 and O_2) in the root zone, by reducing the transport rate of nutrients through the soil, and by creating a physical impedence to root penetration.

SOIL VEGETATION INVENTORY METHOD (SVIM): The method used by BLM for conducting basic soil and vegetation inventories.

STREAM CHANNEL HYDRAULICS: Deals with the dynamics and equilibrium condition of water flowing in open stream channels. With a change in the hydraulics, changes in bed and bank erosion, depositing volume and timing of runoff and peak flow, and pool-riffle ratios would be expected.

STOCKING RATE: The number of animals on a specific area at a specific time, usually expressed in acres/AUM.

STRUCTURE: In reference to vegetation, the configuration of the plants including mean height, age classes, growth forms, and layering.

SUSPENDED PREFERENCE: That portion of the grazing preference which is placed in a suspended category because the preference exceeds the available livestock grazing capacity. Same as suspended nonuse.

THREATENED SPECIES: Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

UNIT RESOURCE ANALYSIS (URA): A comprehensive display of physical resource data and an analysis of the current use, production, condition, and trend of the resource and the potentials and opportunities within the planning unit.

UNSUITABLE RANGE: An area which may have value for wildlife, but is unsuitable for livestock because of barrenness, lack of forage, unstable soils, or physical barriers such as steep topography, rock, or dense timber.

UTILIZATION: The amount of vegetation or foliage removed from a plant by grazing animals. Usually expressed as a percent of the plants total annual weight.

VEGETATION TYPE: A plant community with visually distinguishable characteristics, based upon and named after the apparent dominant plant species.

VIGOR (PLANT): The state of health of a plant.

VISITOR DAY: A 12 hour recreation-oriented visitation period (i.e., 1 person engaged in recreational activities for 12 hours, or 12 persons for one hour, etc.).

VISUAL RESOURCE MANAGEMENT (VRM): The planning, design, and implementation of management objectives to provide acceptable levels of visual impacts for all BLM resource management activities.

WATER GAP: A fenced corridor in a fence to allow access to water.

WETLANDS: Poorly drained areas, usually having impervious soil, which occur in depressions near the bottom of slopes or on large flats. Wetlands receive water from direct precipitation and overland runoff and may be in contact with the ground water system.

WOODLAND CANOPY CLASS: Method of classifying woodland area by percentage of crown closure (area occupied by woodland species as viewed from above). Canopy classes are:

- Sparse: 10% to 39% crown closure.
- Medium: 40% to 69% crown closure.
- Dense: 70% to 100% crown closure.

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Appendices

Appendix A

METHODOLOGY FOR VEGETATION INVENTORY AND FORAGE ALLOCATION, DETERMINATION OF RANGE CONDITION, AND 20 YEAR CONDITION AND PRODUCTION PREDICTIONS

METHODOLOGY FOR VEGETATION INVENTORY AND FORAGE ALLOCATION

A soil and vegetation field inventory was conducted in the Willow Creek Planning Unit from January to September, 1980, to collect data used in determining the amount of forage available for allocation. The methods used for the inventory are described in detail in BLM Manual 4412.14, Soil and Vegetation Inventory Method (SVIM), and BLM Manual 6602, Integrated Habitat Inventory and Classification System. All data, maps, and references pertinent to the inventory and forage allocation process are available for inspection at the Eagle Lake Resource Area Office, Susanville BLM District.

Sample unit stratification was based on a third order soil survey compiled by the Soil Conservation Service (U. S. Department of Agriculture, 1980). Soil mapping units were delineated and described in the soil survey. The potential vegetation of the range site for each soil phase was apportioned by mapping unit in the Soil Survey Legend. Range sites served as the basis for determining range condition (U. S. Department of Agriculture, 1976). A field survey to determine range condition was conducted from January to May, 1980. Once the condition was mapped for the whole planning unit, each range site in a single range condition was considered a site write-up area (SWA). A group of similar SWAs was considered a strata which was then sampled within acceptable statistical limits using transects, plots, and the techniques described in SVIM. The number of plots required for a sufficient sample depended upon the variation among plots, the confidence or probability level desired in the data, and the reliability or precision with which sampling was conducted. Enough plots were sampled to obtain 20 percent precision with 80 percent confidence, i.e., 80 percent of the plots were within plus or minus 20 percent of mean production.

Data processing was conducted by the Denver Service Center, Bureau of Land Management. All sampled vegetation production data was adjusted to a yearly maximum using data from SVIM phenology data forms and a 1979 Cal-Neva Planning Unit plant phenology study. Vegetation data was also adjusted to a medium precipitation year using a climatic adjustment factor derived from precipitation data collected at Susanville and Termo, California (Sneva and Hyder, 1962).

Vegetation production data was used to determine forage allocation, using a linear computer program model developed by Martinson and MacPherson (1979a). The forage allocation model maximized the use of forage available for grazing, subject to proper use factor constraints, plant maintenance or allowable use factor constraints, dietary constraints, animal numbers, and management constraints.

An allowable use factor (AUF) for each type of grazing animal was applied to the production of each plant species to arrive at the total pounds of herbage and the percent of the plant that could be removed by grazing animals without affecting the viability of the plant. The AUFs were weighted to the season of use as follows:

Spring:	March 21 through June 20
Summer:	June 21 through September 20
Fall:	September 21 through December 20
Winter:	December 21 through March 20
Yearlong:	March 21 through March 20

In addition, proper use factors (PUFs) were applied to each plant. Proper use factors include the amount of herbage that can be removed without damaging the plant and the preference of the grazing animal for that particular species. PUFs vary with the season of use because plant defoliation anytime during the growing period is harmful to the plant. Also, production figures are based on mature dry weights. PUFs did not exceed 60 percent of the current year's growth. PUFs used in the determination of forage allocation were obtained from PUF tables prepared by the California and Nevada BLM State Offices.

Objective wildlife numbers were used in the forage allocation process. Upper limits on cattle numbers were left open so that no animal species was given priority over any other species in the forage allocation process.

The amount of feed or forage required by various ungulates for one month (AUM) is shown below:

	Forage Required (lbs./month)
Cattle	800
Horses	1,000
Mule Deer	130
Antelope	54

These figures were used in the forage allocation process to determine total AUMs and pounds of forage consumed for each allotment.

The percent of suitable, potentially suitable, and unsuitable land for each SWA was also entered into the forage allocation model. Suitable land criteria were only established for livestock. Criteria have not been established for wildlife at this time. The criteria were based on distance from water, percent slope, and production. Those SWAs with a production of less more than 25 acres/AUM were considered potentially suitable due to low production. For a detailed explanation of the forage allocation model and process and the relationship of the above variables, see Martinson and MacPherson (1979b).

Consumptive and nonconsumptive forage was obtained from the forage allocation process. Consumptive forage is the amount of forage in pounds consumed by herbivores. Nonsoncumptive forage is forage not used by herbivores; it includes forage needed by the plant for reproduction and physiology, as well as the noxious plants.

Other information received from the forage allocation process was optimal animal mixture, acres per animal unit, and animal unit months for each SWA and for each allotment. This information was used to analyze and determine the environmental consequences of the Proposed Action and alternatives. Because sampling represented production values within 20 percent of the mean, decreases or increases in livestock use were not recommended if the existing use fell within 20 percent of the estimated suitable forage.

DETERMINATION OF RANGE CONDITION

Range condition is the present state of vegetation of a range site in relation to the climax (natural potential) plant community for that site. It is an expression of the relative degree to which the kinds, proportions, and amounts of plants in a plant community resemble that of the climax plant community for the site. Range condition is basically an ecological rating of the plant community (U. S. Department of Agriculture, 1976).

For the purpose of inventory, a range site in a corresponding condition class (i.e., sampling stratum) provided a reasonably consistent plant community from which data could be collected and to which data could be extrapolated. For management, this method of grouping vegetation can:

> "...provide a basis for predicting the extent and direction of changes that can result in the plant community because of specific treatment or management." (U. S. Department of Agriculture, 1976.)

In the field, the present plant community was compared to the climax plant community as described in the range condition guide for the range site. For the existing plant community, the maximum percentage of total production shown for each plant species in the range site guide was the maximum percentage that was counted for a condition rating. The percentages were totaled to indicate the relative ecological rating or numerical evaluation of the stand. The ratings could fall between 0 and 100, depending on how closely the plant community resembled the climax plant community for the range site.

Four classes were used to express the degree to which the composition of the present plant community reflected that of the climax. They are:

Range Condition Class	Percentage of Present Plant Community that is Climax for the Range Site
Excellent	76-100
Good	51-75
Fair	26-50
Poor	0-25

TWENTY YEAR CONDITION AND PRODUCTION PREDICTIONS

Range sites were the basis for determining range condition. Once condition was mapped for the whole planning unit, production transects were run on SWAs (range sites in a particular range condition), representing stratums. Each allotment had its own acreage and combination of stratums.

The following assumptions were made for assessing the changes in range condition in the next 20 years.

1. Some range sites would not improve significantly in condition during 20 years because of poor soils, low precipitation, competition with invader species (e.g., cheatgrass), low plant vigor, and/or insufficient source of climax perennial grass seed (McLean and Tisdale, 1972).

2. Range sites which include a significant remnant population of species considered indicators of excellent and good condition range would remain static under the No Action Alternative.

   Range sites which have a significant remnant population of species considered indicators of excellent and good range condition would improve over a 20 year time span under all other alternatives.

3. Fair condition range would progress to good faster than poor condition range would progress to fair (McLean and Tisdale, 1972).

4. Range sites presently in low fair condition would not progress to good condition in 20 years.

5. Overallocated allotments grazed during the critical spring growing period would begin a downward trend. Fair and good condition range would decrease in 20 years in these allotments under the No Action Alternative.

6. Range sites presently in high poor condition would progress to fair condition within 20 years.

7. Sparse and medium woodland canopy would increase 10 percent in 20 years.

8. Range sites in low fair condition would decrease to poor condition under the No Action Alternative.

9. Those areas under juniper control treatments would be taken out of the woodland canopy class and placed in fair range condition due to good perennial grass production in the understory.

10. Those allotments with AMPs and a rest-rotation grazing system would increase 10 percent in production (Ratliff and Reppert, 1972).

Each range site in a particular condition class has a certain production potential. Production data was obtained through the forage allocation process and averaged to obtain a production estimate for each range site in each range condition class. Each range site was then analyzed to determine changes in condition class resulting from the various alternatives.

An example of the production and condition calculation procedure follows:

The Stony Loam 10-14" range site in poor condition comprises 328 acres in an allotment. The assumption was made, with the improved livestock management under Proposed Action, that one-third of this poor condition range (108 acres) would improve to fair condition in 20 years, while the remaining two-thirds (220 acres) would remain in poor condition.

To obtain the production prediction for that poor condition range in 20 years, the new acreage for poor condition range (220 acres) was divided by the present production figure obtained by averaging the production figures (acres/AUM) of the poor condition site write-up areas in the specific allotment to give the future prediction.

The same range site in fair range condition in the same allotment currently comprises 5,538 areas. Another assumption under the Proposed Action Alternative was that one-third of the existing fair range (1,827 acres) would progress to good condition in 20 years. The other two-thirds (3,711 acres) would remain in fair condition.

To obtain the production predictions for fair condition range in 20 years, the two-thirds remaining in fair condition (3,711 acres) was added to the one-third improving from poor condition (108 acres). The total fair condition acreage (3,819 acres) was divided by the present production figure obtained by averaging the production figures (acres/AUM) of the fair condition site write-up areas in the specific allotment to give the future prediction.

The same range site in good condition in the same allotment currently comprises 86 acres. None of the good range condition class was assumed to progress to excellent.

To obtain the production predictions for good condition range, the fair condition range which progressed to good condition (1,827 acres) was added to the existing good condition range (86 acres). The total good condition acreage (1,913 acres) was divided by the present production figure obtained by averaging the production figures of the good condition site write-up areas in the specific allotment to give the future prediction.

All condition and production predictions by range site were then totaled for the whole allotment to obtain predictions for the entire allotment.

Appendix B

DETERMINATION OF HABITAT CONDITION FOR MULE DEER AND PRONGHORN ANTELOPE

The data used to estimate the habitat condition for deer and pronghorn was collected during the 1980 range inventory using the SVIM method. This data was then compiled by the BLM computer at the Denver Service Center. Vegetation composition by weight, vegetation height, browse vigor, browse canopy cover, and soil surface factors were compiled by stratum. Each stratum was then placed in a condition class using the criteria shown in TABLES B-3 and B-4.

Deer and pronghorn seasonal use areas were delineated along site write-up area (SWA) boundaries. The percentage of a SWA that was made up of a particular stratum and the total acreage of each SWA was known. Therefore, the total acres of good, fair, and poor deer and pronghorn range within each SWA was determined. The total acreage of good, fair, and poor range for deer and pronghorn was then compiled by seasonal use area. Yearlong ranges were first rated season by season and then the acreages of the three classes were averaged to obtain a yearlong rating.

TABLE B-1

Mule Deer Plant Species Value as Forage by Season

Plant Species[1/]	Spring	Summer	Fall	Winter
AGCR	A[2/]	B[3/]	B	C[4/]
AGSM	B	B	C	C
AGSP	A	B	B	C
ARAR8	C	C	B	B
ARARN	C	C	B	A
ARCA13	C	C	B	B
ARTR2	C	C	B	A
ASTER	B	C	C	C
ASTRA	A	B	C	C
BALSA	B	C	C	C
BRTE	A	B	B	B
CAREX	B	B	C	C
CELE3	A	A	A	A
CHRYS9	C	C	C	C
CREPI	A	A	B	C
ELCA5	A	C	C	C
ERCI6	A	B	C	C
ERIOG	B	B	B	B
JUNCU	C	C	C	C
JUNIP	C	C	B	A
LUPIN	B	B	C	C
PHLOX	C	C	C	C
POA++	A	A	B	C
POTR5	A	A	A	A
PREM	B	A	A	A
PRVI	B	A	A	A
PUTR2	A	A	A	A
RANUN	A	B	C	C
RIBES	C	C	C	B
SAVE4	C	C	C	C
SIHY	A	B	B	C
STIPA	A	A	A	C
SYMPH	B	A	A	A
TAOF	A	A	B	C
TETRA3	C	C	C	B
TRIFO	A	A	A	A
VICIA	A	B	B	C

1/ U. S. Department of Agriculture, 1979.
2/ Desirable.
3/ Intermediate.
4/ Undesirable.

TABLE B-2

Pronghorn Antelope Plant Species Value as Forage by Season

Plant Species[1/]	Spring	Summer	Fall	Winter
AGCR	A[2/]	B[3/]	B	C[4/]
AGGL	C	B	C	C
AGSP	A	B	B	C
AMAL2	C	B	C	C
ARAR8	C	A	B	A
ARARN	A	A	A	A
ARCA13	C	A	C	C
ARCTO3	C	B	C	C
ARSP5	A	C	C	C
ARTR2	A	A	B	A
ASTRA	B	B	C	C
ATCO	C	C	B	C
BALSA	C	C	C	B
BROB	C	B	B	C
BRTE	A	B	A	A
CHAEN	A	A	C	C
CHNA2	B	B	B	B
CHVI8	B	A	B	B
CREPI	C	B	C	C
DESCU	C	B	C	C
EPILO	C	B	B	C
ERCI6	B	A	C	C
ERIOG	A	A	A	B
ERIOP2	C	B	B	B
EULA5	C	C	C	A
GILIA	C	B	C	C
GRSP	C	C	C	B
HELIA3	C	C	C	B
IVAX	B	A	A	C
JUNCU	B	C	C	C
JUNIP	B	B	B	C
LINUM	C	A	A	C
OENOT	A	A	A	C
ORHY	B	C	C	C
PENST	A	A	C	C
PHLOX	A	A	C	B
POA++	A	B	B	C
POLYG4	C	A	B	C
PUTR2	A	A	B	C
SAKAT	C	A	B	B
SAVE4	C	C	C	B
SIHY	B	C	C	C
SYMPH	C	B	C	C
TETRA3	C	B	C	C
TRIFO	B	B	C	C
VIOLA	C	B	C	C

1/ U. S. Department of Agriculture, 1979.
2/ Desirable.
3/ Intermediate.
4/ Undesirable.

TABLE B-3

Habitat Condition for Mule Deer - Rating Criteria

Condition Class	Vegetation Composition	Vegetation Height	Browse Vigor	Browse Canopy Cover	Soil Surface Factor	Overall Condition
SPRING-SUMMER FALL-FAWNING						
Good (3 points)	A & B browse species (2 or more) make up 75% of browse composition. A & B forb & grass species (3 or more) make up 75% of forb & grass composition.	Less than 5'.	Less than 15% of A species severely hedged & decadent minus seedling + young of all species less than 15%.	Greater than 35%. Fawning: Greater than 50%.	Less than 20.	Total of 12 or more points.
Fair (2 points)	A & B browse species (2 or more) make up 50-75% of browse composition. A & B forb & grass species (3 or more) make up 50-75% of forb and grass composition.	5' to 7'.	Less than 35% of A species severely hedged & decadent minus seedling + young of all species less than 35%.	20-35%. Fawning: 30-50%	20-60.	Total of 9-11 points.
Poor (1 point)	A & B browse species make up less than 50% of browse composition or A & B forb & grass species make up less than 50% of the forb & grass composition.	Greater than 7'.	More than 35% of A species severely hedged or decadent minus seedling + young of all browse species greater than 35%.	Less than 20%. Fawning: Less than 30%.	Greater than 60.	If good or fair, requirements are not met.
WINTER						
Good (3 points)	A & B browse species make up 75% of browse composition greater than 50% of total composition.	Less than 5'.	Less than 15% of A species severely hedged & decadent minus seedling + young of all species less than 15%.	Greater than 35%.	Less than 20.	Total of 12 or more points.
Fair (2 points)	A & B browse species make up 50-75% of browse composition. Total browse composition 30-50% of total composition.	5' to 7'.	Less than 35% of A species severely hedged or decadent minus seedling + young of all species less than 35%.	20-35%.	20-60.	Total of 9-11 points.
Poor (1 point)	A & B browse species make up less than 50% of browse composition. Total browse composition less than 30% of total composition.	Greater than 7'.	More than 35% of A species severely hedged or decadent minus seedling + young of all browse species greater than 35%.	Less than 20%.	Greater than 60.	If good or fair, requirements are not met.

TABLE B-4

Habitat Condition for Pronghorn Antelope - Rating Criteria

Condition Class	Vegetation Composition	Vegetation Height	Browse Vigor	Browse Canopy Cover	Soil Surface Factor	Overall Condition
SPRING-SUMMER FALL-FAWNING						
Good (3 points)	A & B forbs & grasses more than 50% total composition and A & B shrubs more than 10%.	Average 10-18".	Less than 15% of A species severely hedged & decadent minus seedling + young of all species less than 15%.	10-20%.	Less than 20.	Total of 12 or more points.
Fair (2 points)	A & B forbs, grass 20-40%. A & B shrubs 5-10%.	Average 5-9.9" or 18.1-28".	Less than 35% of A species severely hedged & decadent minus seedling + young of all species less than 35%.	3-10% or 20-32%.	20-60.	Total of 9-11 points.
Poor (1 point)	A & B forbs & grasses less than 20%. A & B shrubs less than 5%.	Average less than 5" or greater than 28".	More than 35% of A species severely hedged or decadent minus seedling + young of all species greater than 35%.	Less than 3% or Greater than 32%.	Greater than 60.	If good or fair, requirements are not met.
WINTER						
Good (3 points)	A & B browse species (3 or more) make up 75% or more of the browse composition with all browse species at least 30%. Forbs & grasses make up at least 15%.	Average 10-18".	Less than 15% of A species severely hedged & decadent minus seedling + young of all species less than 15%.	10-20%.	Less than 20.	Total of 12 or more points.
Fair (2 points)	A & B browse species make up 50-74% of browse composition with all species 10-29% and forb & grass species 5-15% overall composition.	Average 5-10" or 18.1-28".	Less than 35% of all A species severely hedged & decadent minus seedling + young of all species less than 35%.	3-10% or 20-32%.	20-60.	Total of 9-11 points.
Poor (1 point)	A & B browse species make up less than 50% of browse composition with all browse make up less than 10% of total composition or forb & grass species make up less than 5% of total composition.	Average less than 5" or greater than 28".	More than 35% of A species severely hedged or decadent minus seedling + young of all browse greater than 35%.	Less than 3% or greater than 32%.	Greater than 60.	If good or fair, requirements are not met.

Appendix C

CULTURAL RESOURCE SURVEYS: METHODS, RESULTS

I. CULTURAL RESOURCE DATA BASE

Information on the cultural resources in the Willow Creek Planning Unit has been synthesized from the following sources: 1) An existing data inventory conducted by BLM cultural resource staff; 2) Excavation reports documenting research conducted within and adjacent to the planning unit (Fenenga and Riddell, 1949; Friedman, 1976, 1977; Pippen et al., 1979; Riddell, 1957, 1960; Wohlgemoeth, 1978); published ethnographic accounts (Evans, 1949, 1967; Garth, 1953; Olmstead and Steward, 1978; Riddell, 1960, 1978a, 1978b); 4) Historical documentation (Amesbury, 1964, 1967; Fairfield, 1916; Farris and Smith, 1882; Middleton, 1963); 5) Archaeological Survey of Lassen County (Riddell, 1950); 6) 1978 BLM survey of Eagle Lake; 7) 1981 USFS survey of Eagle Lake; 8) BLM Class II Survey of Willow Creek Planning Unit; 9) Intregration of various project-specific surveys initiated by various agencies (Caltrans, BLM, USFS) in compliance with 36 CFR 800; 10) Anthropological overview (Theodoratus, 1979); and 11) Historical overview (Roberts, 1980).

II. BLM CULTURAL RESOURCE INVENTORIES

A. Field Inventory

Two controlled surveys were conducted within the Willow Creek Planning Unit. The first survey was conducted by Corson and Smith in 1979 in the Eagle Lake area, while the second, covering the rest of the planning unit, was conducted by Manuel in 1980. Both surveys were aimed at defining the numbers, types, significance, and sensitivity of sites, but different methods were used to obtain the data. Because different major site typing classifications were used for the two surveys, a third, more general, system is used for this document. TABLE C-1 shows the three systems.

TABLE C-1

Willow Creek Planning Unit Site Types

EIS Site Type	Eagle Lake Survey	Class II Survey
Village	Class I	MA
Base Camp	Class II	MB
Temporary Camp	-	MC
Lithic Scatter	Class III	TA
Milling Station	Class VII	TB
Limited Activity Area	-	TC
Petroglyphs/p	Class V	TD
Quarry	Class VI	TF
Hunting Blinds	Class IV	TG
Historic Sites	Class VIII	H
Ethnographic Sites	-	E
Sacred Sites	-	S
Isolated Finds	Isolated Finds	IF

TABLE C-2

Archaeological Surveys within the Willow Creek Planning Unit

Survey	Total Acres Sampled	Total BLM Acres Sampled	Acres Surveyed	Sample Units	Number of Sites	Site Density (Sites/Mile^2)
1978 Eagle Lake Survey	93,920	60,000	9,600	60	102	3.4
1981 Random Sample	236,051	236,051	7,260	28	33	1.3
Projects	700	700	700	1	1	1.0

TABLE C-3

Distribution of Site Types by Sample Strata

			STRATUM															
			SLOPE				WATER											
			Steep		Gradual		Far		Near		VEGETATION[3/]							
Site Type	Willow Creek PU[1/]	Eagle Lake	WC[1/]	EL[2/]	WC[1/]	EL[2/]	WC[1/]	EL[2/]	WC[1/]	EL[2/]	B	L	J	D	M	F	NF
Village	7	14	0	0	7	2	1	2	5	2	3	2		2			10
Base Camp	7	32	0	2	7	7	1	7	6	6						6	3
Temporary Camp	3	0	1	0	2	0	1	0	2	0	1	1			1		
Lithic Scatter	8	130	1	9	7	76	3	19	5	64	6	2				7	76
Milling Station		2	0	0	1	0	1	0	0	0	1						
Limited Activity Area	1																
Petroglyphs	9		0	0	9	0	5	0	4	0	3	2		4			
Quarry		3	0	1	0	0	0	1	0	0						1	
Hunting Blinds		9				3				3						3	
TOTAL	30	190[4/]	2	12	33	88	12	29	22	75	14	7		6	1	17	89

1/ Willow Creek Planning Unit
2/ Eagle Lake
3/ B = Big Sage Association
L = Low Sage Association
J = Juniper Plant Association
D = Desert Shrub Association
M = Mountain Shrub Association
F = Forested Area
NF = Nonforested Area
4/ Total site numbers are in excess of the numbers listed in TABLE C-2.

B. Eagle Lake Survey

1. Description

The Eagle Lake survey was conducted in 1978 and was directed to answer the following questions (Corson and Smith, 1979):

a. What kinds of culture sites occur in the Eagle Lake area?

b. What is their significance?

c. Where are they located?

d. What factors are currently afflicting these sites?

e. On the basis of questions 3 and 4 above, which areas are likely to be most sensitive to the impacts of development?

To answer these questions, Corson and Smith (1979) opted for the following research design and strategy: The study area was divided into three variables, based on slope, nearness to water, and major vegetation category (either forest or non-forest). Some 60 sample units (¼ sections) or 9,600 acres were surveyed out of a total of 93,920 acres within the Eagle Lake area. The sample units were surveyed by teams of 2 to 3 archaeologists.

TABLE C-4

Study Area Stratification and Sample Apportionment 1/

Stratum 2/	Acreage	Sample Units Surveyed
000	29,760	16
001	18,400	13
010	800	1
011	1,760	1
100	25,440	16
101	11,680	9
110	1,600	1
111	4,480	3
TOTAL	93,920	60

1/ Corson and Smith, 1979.
2/ Stratification elements (by digit):

Slope:	0 = Steep	1 = Gradual
Vegetation:	0 = Forested	1 = Nonforested
Water:	0 = Away from Water	1 = Near Water

2. Survey Results

The 1978 survey resulted in the recognition and recording of some 102 previously unrecorded cultural sites, of which 52 were found within the sample units (Corson and Smith, 1979).

3. Site Types

The following site types, based on details of surface assemblages (artifacts and features, size and density), were noted by Corson and Smith:

Class I Sites: These sites consist of relatively large (200' or greater) and dense lithic scatters, with pronounced milling stone components and stone constructions ("rings") probably functioning as substructures for domestic architecture. In certain cases, house depressions or cleared circles ("living surfaces") may also be present, as may weakly to strongly developed middens. One of these sites contains petroglyphs.

Class II Sites: Several sites display the principal characteristics (large, relatively dense lithic scatters with milling stone components) found at Class I Sites, while lacking the stone constructions which ultimately define the Class I Sites. Cleared circles may be present, but middens are weakly developed (though subsurface deposits may be anticipated from natural soil processes).

Class III Sites: The most abundant site-type recorded during the 1978 survey consisted of generally small (less than 200' diameter), sparse lithic scatters with few or no functionally diagnostic artifacts. The most frequently occurring artifact at these places is the projectile point (irrespective of style), suggesting that hunting was among the most geographically diverse pursuits during all phases of past occupancy within the basin. Corson (1977) has proposed certain conditions under which, in Great Basin regions immediately northeast, small lithic scatters may provisionally be identified as "hunting stations". Several of these Class III Sites would qualify as 'hunting stations.'

Class IV Sites: On the upper reaches of a few slopes, and along ridgecrests, short (6' to 10') walls of piled stone are found in straight or crescentic alignments. Sparse lithic scatters may be associated. These almost unquestionably constitute ambush sites serving game hunting strategies; ethnographic references to similar features are common.

Class V Sites: The 1978 survey, as well as previous surveys, found that petroglyphs were scarce in the Eagle Lake basin: While galleries appear not to occur, isolated panels have been noted, both within the precincts of large (Class I) occupation sites, as well as in isolation from other cultural features.

Class VI Sites: While natural fine-grained, cryptocrystalline, or glassy stones are not common in the study area, quarries of locally available lithic material are not unknown. Primary reduction of local basalts has been recorded on the northwestern flank of the lake (1978 survey), and exploitation of nodular obsidian on the northeast has been tentatively suggested by Ridgway (1977). Hanks (1886) reported obsidian "in great abundance on the east side of Eagle Lake," a note which Gester (1962) was unable to confirm, but the possibility remains that important obsidian deposits occur within the basin.

Class VII Sites: Certain small places are marked by, or are dominated by, single or clusters of millingstones. Very sparse lithic scatters may be associated. They are apparently related to the field processing of locally available plant foods.

Class VIII Sites: Historic sites were encountered much less frequently than prehistoric sites during the 1978 survey. Nonetheless, a number of places were found to reflect human use extending from the earliest historical occupancy of the area. For the most part, these sites consist of pioneer domestic structures and, from a later era, the remains of the various schemes to tap the waters of Eagle Lake for irrigation purposes in the Honey Lake Valley.

Isolated Finds: During the course of the 1978 survey, a number of functionally diagnostic artifacts were identified in isolation from any recorded site precinct. While these were not assigned site numbers, they were sketched and recorded in the field. They mark single activity episodes (e.g., hunting, gathering), the nature and chronology of which, in certain cases, can confidently be inferred.

TABLE C-5

Observed Site Densities by Sample Strata

Stratum	¼ Section Units Surveyed	Observed Site Density/Mile^2
000	16	1.2
001	13	1.8
010	1	8.0
011	1	0.0
100	16	1.7
101	9	5.3
110	1	0.0
111	3	25.3
	TOTAL = 60	AVERAGE = 3.5

TABLE C-6

Distribution of Site Classes by Sample Strata
(Cross Stratification)

	STRATUM							
SITE CLASS	000	001	010	011	100	101	110	111
I	0	0	0	0	0	0	0	2
II	1	0	1	0	4	2	0	1
III	4	4	1	0	2	9	0	12
IV	0	0	0	0	0	0	0	3
V	0	0	0	0	0	0	0	0
VI	0	1	0	0	0	0	0	0
VII	0	1	0	0	0	0	0	0
VIII	0	0	0	0	1	1	0	1
TOTALS	5	6	2	0	7	12	0	19

As can be seen from the above charts, stratum 8 (111) (gradual slope, non-forested, and near water) produced the largest number of sites (19), followed by Stratum 6 (101) (gradual, forested, near water: 12 sites).

Stratum 8 is located along the margins of Eagle Lake, an area very likely to be impacted by any project in this area. Based on results of the first stage survey, and in view of the possibility of disturbance to these sites, a second or stage 2 survey was completed in this stratum with an additional 51 cultural sites recorded. These sites fell within the following site types:

Site Class	I	II	III	VII	VIII
# Recorded	8	5	34	2	2

3. Conclusion

Corson and Smith (1979) summed up the results of their work as follows:

a. The main attraction of the basin appears always to have been the Eagle Lake shoreline and its immediate flanks because of the availability and ease of access to food resources.

b. The farther one travels from the lake, the less dense the site patterning becomes.

c. The aboriginal populations used the basin only seasonally and were focusing principally on shoreline and lower zone resources.

C. Willow Creek Survey

1. Description

After the conclusion of the Eagle Lake Survey, there were still approximately 725 sections remaining within the Willow Creek Planning Unit that required a sample inventory, and a two-stage sample design was to be implemented to accomplish this. The first stage was to be a 0.03% sample, followed by an additional 0.02% sample in the second stage, for a total of a 0.05% test sample. The sample units were based on steepness, nearness to water, and major vegetation type.

Willow Creek Planning Unit Stratification Key

S = Steep	N = No Water	J = Juniper
G = Gradual	B = Big Sage	D = Salt Desert Shrub
W = Water	L = Low Sage	M = Mountain Shrub

Number of Sections by Type

SWB - 58	SNB - 111	GWB - 99	GNB - 116
SWL - 8	SNL - 16	GWL - 45	GNL - 35
SWJ - 7	SNJ - 10	GWJ - 24	GNJ - 19
SWD - 0	SND - 0	GWD - 25	GND - 11
SWM - 20	SNM - 36	GWM - 10	GNW - 22
SWT - 6	SNT - 4	GWT - 17	GNT - 16
SWF - 0	SNF - 1	GWF - 0	GNF - 6

TOTAL = 725 Sections

Percent of Stratum

SWB - 8.0	SNB - 15.0	GWB - 14.0	GNB - 16.0
SWL - 1.0	SNL - 2.0	GWL - 6.0	GNL - 5.0
SWJ - 0.9	SWJ - 1.0	GWJ - 3.0	GNJ - 3.0
SWD - 0.0	SND - 0.0	GWD - 3.0	GND - 2.0
SWM - 3.0	SNM - 5.0	GWM - 1.0	GNM - 3.0
SWT - 0.8	SNT - 0.5	GWT - 2.0	GNT - 2.0
SWF - 0.0	SNF - 0.1	GWF - 0.0	GNF - 0.8

TOTAL = 98.1%

Bureau Cultural Resource Class II survey methods call for 50 meter parallel transects conducted over the entire sample unit (usually a quarter section or section). Budget and time restraints, priorities, and weather prohibited the full application of this method for the Willow Creek Planning Unit. In stead, the Class II Survey was conducted by one person over a two to three month period. In some cases, standard survey procedure was followed, with complete quarter sections and sections transected, but in most cases the sample units were sampled instead of surveyed.

A combination of intuition and transects were used to survey most sample units because it was determined that obtaining many samples of the area was more important than surveying only a few complete sample units. This approach also minimized time spent surveying areas of low site density or those without danger of major destruction or disturbance. For example, much of the planning unit is covered by lava flows or steep slopes. Several transects through these kinds of areas showed that site density was either low or that the sites that were located there, usually hunting-related sites and petroglyphs, would not be impacted by current BLM programs such as grazing. It also became apparent that the time spent in these hard-to-work areas could be better used in areas that would receive or were already receiving impacts. Consequently, areas best suited for grazing and recreation were most surveyed. While biasing the sample, this methodology insured that areas of ongoing impact would have some reliable data.

Programs have recently been developed and are now being implemented in the Willow Creek Planning Unit to remedy deficiencies in base cultural resource data identified in the Class II survey. These programs include:

a. Complete Class III inventories in areas of identified high site sensitivity to determine number and kind of cultural resources present. See Willow Creek Planning Unit Resource Analysis for details. (U. S. Department of Interior, 1981).

b. An additional 0.02% survey of areas that did not receive adequate coverage during the Class II inventory.

c. An inventory of those 378 Lassen County sites identified by Riddell in 1948. These sites were recorded from information obtained from local informants (both white and Native American) and many have never been field checked. This survey will not only help to determine present site condition and impacts, but also should help predict ethnographic and prehistoric density and sensitivity patterns.

2. Results

The following numbers of sections were sampled:

Stratum	Gross Number	Number Sampled	Sites Found
GNB	116	5	5
GNJ	16	1	0
SNJ	10	1	0
GWB	99	6	14
GNL	35	3	5
GNJ	19	1	0
SWL	8	1	0
SNL	16	1	0
SNB	111	1	1
SWB	58	3	4
GND	11	1	1
GWL	45	3	4
SWM	20	1	1

The site types found within the Willow Creek Planning Unit were defined using the following criteria: site size and density, internal site components and possible function, the site's observed depth, and its relative physical location. All of these criteria were based on what was observed in the field, usually on the surface, at each site.

In many cases the significance of these sites is unknown because of the relatively unknown local prehistory in the Willow Creek Planning Unit. Estimates of site significance are frequently based on comparisons with adjacent areas. Many of the questions dealing with site function and site significance can only be answered after the area's data base is expanded to a more usable level.

3. Site Types

Multi-Component Sites (M): A multi-component site is a site that contains more than one component or use area. For example, the site could contain rock rings, a lithic scatter and petroglyphs, or a lithic scatter and milling implements. Other individual site components could include middens, pictographs, hunting blinds, bedrock mortars, quarry and burial areas. There are three types of multi-component sites: A) large (over 160 acres in size or at least ¼ mile in length); B) medium (5 to 160 acres in size); and C) small (less than 5 acres in size).

Task Sites (T): Task sites are cultural resource sites that have one presumed use, that is, they are single component sites. There are several types of task sites, including the following:

A. Lithic Scatters: A lithic scatter is a flake scatter littered over a given area. Lithic scatters are composed of flake artifacts (projectile points, knives, etc.) and their associated waste material and are usually associated with hunting, butchering, and tool manufacture. Lithic scatters are classed by size and density as follows:

Size: (L) - Large (over 160 acres)

(M) - Medium (5 to 160 acres)

(S) - Small (under 5 acres in size)

Density: (H) - Heavy (more than 50 flakes per square meter)

(M) - Medium (10 to 50 flakes per square meter)

(L) - Light (less than 10 flakes per square meter)

B. Vegetal Processing/Procurement Stations (VPPS): A VPPS contains milling implements and/or bedrock mortars and are usually associated with some type of food processing or gathering area.

C. Chipping Station (CS): A CS contains 10 or less flakes of the same material and is associated with hunting.

D. Petroglyphs/Pictographs: These sites consist of drawings or figures picked, scraped, or painted on rock surfaces. Their actual use is unknown, but they are thought to be associated with hunting magic, or religion and may have also been used for making tribal boundaries or as trail markers.

E. Rock Shelters/Caves: Natural cavities or overhangs that were aboriginally utilized. Other types of sites are frequently found within or adjacent to rock shelters and caves.

F. Quarry/Workshop Areas: Areas of lithic (raw stone) procurement. Frequently, these sites are related to tool manufacture, especially of blanks (rough outs).

G. Hunting Blinds: Small (6' to 10') constructions with chiefly slightly crescentric walls, of piled stone. Throughout California and the Great Basin such structures have been interpreted as blinds or ambushes for the hunt. They usually occur in association with small, light lithic scatters.

H. Rock Rings: These types of sites are similar to hunting blinds, but are the remnants of houses or brush wickiups. They are usually identified by a single ring of rocks that may or may not have an opening. Sometimes this type of site is made up of a depression (or house pit) surrounded by a ring of rocks. In some areas, large rock rings without depressions are thought to have been used for religious purposes.

I. Kill and Butchering Sites: Similar to chipping stations, except butchering tools (knives, choppers, utilized flakes, etc.) are present.

J. Isolated Artifacts: Individual tools in isolated locations.

K. Historic Sites: Sites relating to the Historic/Settlement era.

L. Ethnographic Sites: Recently utilized sites.

M. Sacred Sites: Areas of religious or spiritual significance to present day Native Americans.

TABLE C-7

Inventory Results

Site	Stratum	Type 1/	National Register Quality	Environment
34.13.10.1	GBN	MA	Yes	Adjacent to creek.
34.13.10.2	GNB	TC	No	In lava flows.
34.14.33.1	GWB	TA	No	At confluence of two drainages.
34.14.12.1	GNL	TA	No	On bench above reservoir.
34.14.12.2	GNL	MA	Yes	On sandy beach adjacent to creek.
34.15.7.1	GNL	MC	Yes	On sandy flat.
34.15.7.2	GNL	MA	Yes	On sandy beach above creek.
32.13.1.1	GNB	MA	Yes	On sandy flat with midden.
32.15.4.1	GWB	TA	No	Above creek.
32.15.4.2	GWB	TA	No	In lava flows.
32.15.8.1	SNB	MC	Yes	On sandy flat.
32.15.9.1	GWB	MB	Yes	On sandy flat near spring.
32.15.9.2	GWB	MA	Yes	On sandy flat near spring.
32.15.9.3	GWB	TA	No	On sandy flat near spring.
32.15.9.4	GWB	TA	No	Confluence of two creeks.
31.12.17.1	SWB	MB	Yes	On sandy flat above creek.
31.15.31.1	GWD	MB	Yes	On sandy flat above creek.
31.15.31.2	GWD	MB	Yes	On sandy flat.
31.15.31.3	GWD	MA	Yes	On sandy flat.
31.15.31.4	GWD	MA	Yes	On sandy flat above creek.
31.15.32.1	GWD	MA	Yes	On sandy flat above creek.
30.15.6.1	GNB	TA	No	In sandy area.
30.14.35.1	GWB	TD	Yes	In lava flows.
31.14.35.2	GWD	TD	Yes	In lava flows.
31.14.35.3	GWB	TD	Yes	In lava flows.
30.14.4.1	GNB	TD	Yes	In lava flows.
30.14.7.1	GWB	TD	Yes	In lava flows.
30.14.7.2	GWD	TD	Yes	In river canyon.
30.14.7.3	GWD	TD	Yes	In river canyon.
30.13.12.1	GWL	MC	Yes	In river canyon.
30.13.1.1	GWL	TD	Yes	In river canyon.
30.13.1.2	GWL	TD	Yes	In river canyon.
30.13.2.1	GWL	MC	Yes	At confluence of two creeks.
30.13.21.1	GWL	MB	Yes	In lava above creek.
30.13.21.2	GWL	TA	No	In lava basin.
30.15.20.1	SWM	MC	Yes	Near spring.

1/ Number of sites: MA - 8; MC - 5; TC - 1; MB - 5; TA - 8; TD - 9.

Appendix D

REPRESENTATIVE COW/CALF BUDGETS - 1980

TABLE D-1

Representative Cow/Calf Budget-1980[1/]
200 Cow Herd Operation

Item	Weight Each	Unit	Price or Cost/Unit	Quantity	Value or Cost
GROSS RECEIPTS					
Calves, Steer	4.00	CWT.	75.000	78.000	23,400.00
Calves, Heifer	3.75	CWT.	65.000	53.000	12,918.75
Cull Cow	9.50	CWT.	40.000	25.000	9,500.00
Cull Bull	14.00	CWT.	53.000	3.000	2,226.00
TOTAL					48,044.75
GROSS INCOME PER LBS.					0.6080
VARIABLE COSTS					
Feed Costs					
Pub. Graz-BLM (Willow Cr.)		AUMs	2.360	312.000	736.32
Hay		Ton	30.000	479.000	14,370.00
Total Feed Cost					15,106.32
OTHER COSTS					
Salt		Head	1.250	235.000	293.75
Vet. & Med.		Head	5.000	200.000	1,000.00
Pregnancy Test		Head	1.500	50.000	75.00
Fly/Tick Treatment		Head	0.250	235.000	50.75
Replacement Bull		Head	1,200.000	3.000	3,600.00
Tractors (Fuel-Lube-Rep.)		Dollar			801.00
Machinery (Fuel-Lube-Rep.)		Dollar			1,815.35
Equipment (Fuel-Lube-Rep.)		Dollar			1,426.83
Interest on Operating Cap.		Dollar	0.14000	26,543.98	3,716.16
TOTAL VARIABLE COSTS					27,893.16
VARIABLE COST PER LBS.					0.3530
INCOME ABOVE OPERATING COSTS					20,151.59
INCOME PER LBS.					0.2550
OVERHEAD					
Personal Property Taxes					115.26
Real Property Taxes					3,009.87
TOTAL OVERHEAD					3,125.13
OVERHEAD COST PER LBS.					0.0395
TOTAL CASH EXPENSE					31,018.29
CASH EXPENSE PER LBS.					0.3926
INCOME ABOVE CASH COSTS					17,026.46[2/]

1/ Source: Adapted from budgets provided by University of California Cooperative Extension and the Cal-Neva/Willow Creek Range Improvement Association. A complete budget is available for review in the BLM Susanville District Office.

2/ Does not include depreciation, interest on capital investment, or costs of family labor.

TABLE D-2

Representative Cow/Calf Budget-1980
1,000 Cow Herd Operation

Item	Weight Each	Unit	Price or Cost/Unit	Quantity	Value or Cost
GROSS RECEIPTS					
Calves, Steer	4.00	CWT.	75.000	390.000	117,000.00
Calves, Heifer	3.75	CWT.	65.000	265.000	64,593.75
Cull Cow	9.50	CWT.	40.000	125.000	45,700.00
Cull Bull	14.00	CWT.	53.000	15.000	11,130.00
TOTAL					240,223.75
GROSS INCOME PER LBS.					0.6080
VARIABLE COSTS					
Feed Costs					
Pub. Graz-BLM (Willow Cr.)		AUMs	2.360	1,200.000	2,832.00
Other Grazing		AUMs	2.360	3,600.000	8,496.00
Hay		Ton	30.000	2,421.000	72,630.00
Total Feed Cost					83,958.00
OTHER COSTS					
Salt		Head	1.250	1,185.000	1,481.25
Vet. & Med.		Head	5.000	1,000.000	5,000.00
Pregnancy Test		Head	1.500	250.000	375.00
Fly/Tick Treatment		Head	0.250	1,185.000	296.25
Hired Labor		Month	1,000.00	24.000	24,000.00
Seasonal Labor		Month	1,000.00	6.000	6,000.00
Replacement Bull		Head	1,200.000	15.000	18,000.00
Repairs		Dollar	1,000.000	1.000	1,000.00
Tractors (Fuel-Lube-Rep.)		Dollar			1,484.92
Machinery (Fuel-Lube-Rep.)		Dollar			12,826.39
Equipment (Fuel-Lube-Rep.)		Dollar			16,516.95
Interest on Operating Cap.		Dollar	0.14000	151,861.23	21,260.57
TOTAL VARIABLE COSTS					192,199.33
VARIABLE COST PER LBS.					
INCOME ABOVE OPERATING COSTS					48,024.42
INCOME PER LBS.					
OVERHEAD					
Personal Property Taxes					517.53
Real Property Taxes					18,870.80
TOTAL OVERHEAD					19,388.33
OVERHEAD COST PER LBS.					
TOTAL CASH EXPENSE					211,587.66
CASH EXPENSE PER LBS.					
INCOME ABOVE CASH COSTS					28,636.09 2/

1/ Source: Adapted from budgets provided by University of California Cooperative Extension and the Cal-Neva/Willow Creek Range Improvement Association. A complete budget is available for review in the BLM Susanville District Office.

2/ Does not include depreciation, interest on capital investment, or costs of family labor.

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THREATENED AND ENDANGERED ANIMALS: 2-31, 3-13, 4-3, 4-12, 4-19, 4-25, 4-30.
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VEGETATION: 2-31, 3-2, 4-5, 4-6--4-9, 4-14--4-16, 4-20, 4-21--4-24, 4-26, 4-27, 4-32, 4-36, 4-37, 4-38, A-1--A-5, B-1--B-5.
  See Also: Range Condition and Production.
  Allocation: 2-6 & 2-8, 2-13, 2-19, 2-25, A-1--A-3.
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WILDERNESS: 2-1, 2-31, 3-16--3-17, 4-11, 4-17, 4-24, 4-29, 4-33, 4-37.
WILDLIFE: 1-1, 2-1, 2-31, 3-7--3-14, 4-2--4-3, 4-5, 4-11--4-12, 4-14, 4-18--4-19, 4-21, 4-25, 4-27, 4-29--4-30, 4-32, 4-36, 4-37, 4-38, A-1--A-3, B-1--B-5.
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Pronghorn: 2-1, 3-10, 4-2--4-3, 4-12, 4-18, 4-25, 4-30, 4-36, 4-38, A-1--A-3, B-1, B-3, B-5.
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